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FREUD AND ROMANTIC MEDICINE

IAGO GALDSTON

This essay is offered as a contribution to the exegesis of psychoanalysis. It aims to lay bare some of the sources of Freud's ideas, and to specifically relate them to certain relevant ideas promulgated in Romantic Medicine.

I approach my task in the dual role of psychiatrist and medical historian. Both disciplines are requisite, psychiatry in order to understand Freud's own *élan vital*, and medical history to adequately appreciate the cultural setting and intellectual climate in which Freud grew up, matured, and effected his revolution in psychiatry.

Mine is not the first attempt to trace Freud's ideas to their sources of origin. Indeed there is a welter of such attempts. Many of them are concerned with uncovering so-called forerunners to, and anticipators of, Freud. But there also have been some more meritorious attempts, such as were made by Dr. and Mrs. Bernfeld, Marie Dover of Darmstadt, and Louise von Karpinska of Poland. The most competent and the most penetrating efforts in this direction, however, stand to the credit of Fritz Wittels. His biographic study of Freud, together with his *Freud and His Time*, afford one valuable insight into the personality of Freud and into the relatedness of his ideas to those of his forerunners.

My own efforts at "tracing" Freud's ideas to their sources of origin are favored above those of my predecessors, including Wittels, in that I have, as they had not, access to the Fliess letters, and to the data

concerning Freud's childhood, and young manhood given in the Jones biography. Of the two the Fliess letters are the more important.

In the exegesis of psychoanalysis three factors call for thorough study: first and foremost the person of Freud; second, the derivation and structuralization of his ideas; and third, the impact of those ideas upon the realm of science and thought. This is patently a task of gigantic dimensions, and at this juncture I can pretend to no more than a modest enterprise.

What is to be noted relative to the person of Freud? Freud was a Jew, living in anti-Semitic surroundings. One of his earliest memories of his father revolved about an episode in which the father was insulted and could not, or would not, avenge himself, but swallowed the insult in a manner that seemed craven to Freud.

Freud was poor. He grew up in a home where want was not depraving but where it was an indwelling and abiding *Sorge*. Freud knew and suffered the hobbling effects of poverty for the greater portion of his childhood, his youth, and young manhood.

Freud grown into manhood was compelled by want to do that which promised him a living rather than what he wanted or would have preferred to do. His entire being was conditioned by these cruel and degrading determinants. The proverty that engulfed Freud was not simply economic: it was all-pervading, it was atmospheric. It is difficult to conceive the qualitative character of the poverty that engulfed a poor Jew living in Vienna during the latter half of the last century. It was not so much depraving in its effects as it was overwhelming and paralyzing. In such an atmosphere only those survive who have great endurance, and only those prevail who are gifted with an inordinate drive and with such competences as can lift them over the barriers of social insignificance, economic want, and racial prejudice.

Fortunately Freud was endowed with just such gifts and competences. He had an inordinate drive, great energy, and a superb intellect. But it must be understood that Freud's historical position is essentially the resultant of the interplay between his native qualities and the deprivational and provocative setting in which they operated. It is both conceivable and highly probable that had Freud not been subjected to the goadings of his manifold poverty he would not have risen beyond the relative mediocrity of an able man. Again, were Freud less gifted he would most likely have been lost in that anonymity of the *Kleinbürgertum* or the *Handelsstand* that embraced in its amorphous ambient the greater portion of Vienna's Jewry. But Freud was ambitious. That more than anything

else is the outstanding characteristic of his personality. He was ambitious to avenge the Stygian nothingness of his origin, to more than make up for the insignificance of his patrimony and the devastating mediocrity, the undistinguished platitudinousness of the world in which he suffered his youth.

Given his goading resentment, his driving ambition, and his gifts, it can be predicated that Freud would have succeeded in any undertaking. He would have made his mark in any field. Whether it would have been so great a mark, so shining an achievement as that represented by psychoanalysis, is a moot question. For in the fruition of psychoanalysis are implicated certain fortuitous circumstances extraneous to Freud and his immediacies. Chief among these fortuitous and extraneous circumstances were the then prevailing convictions and patterns of scientific thought. And equally fortuitous and fortunate were the circumstances that brought Freud in contact with, and exposed him to, the influences and inspirations of a number of men—Breuer, Charcot, and Fliess. The last named, in my judgment, had the profoundest effect upon Freud's intellectual development—vastly greater than any of Freud's biographers have recognized or acknowledged.[1]

Fliess has received but scant justice from Freud's biographers. Of course, Freud was their main concern and Fliess was but a side issue. In the Fliess letters, ingenuously labelled *Aus den Anfängen der Psychoanalyse*,[2] (and not Freud's letters to Fliess) they sought for and found Freud, not Fliess. Of Fliess they were content to note that " he was said to be " charming and that he was some sort of crank about numbers. That and a few derogatory opinions quoted from among his disagreeing contemporaries and the picture is complete![3] Fliess was not of Freud's

[1] I premise neither calculated neglect nor willful supression of any essential data. It is rather that Freud's biographers in the first instance were not aware of the quality and nature of Freud's friendship with Fliess, and Jones, who has written with the benefit of the Fliess letters, and much else beside, is either ignorant of, or too little concerned with, the philosophical and historical implications of the ideas so intimately shared by Freud and Fliess during the fifteen years of their association, years which confessedly were formative for Freud.

[2] Freud, Sigmund: *Aus den Anfängen der Psychoanalyse. Briefe an Wilhelm Fliess, Abhandlungen und Notizen aus den Jahren 1887-1902.* Imago Publishing Co., Ltd., London, 1950.

[3] Jones vs. Jones—" Of more lasting assistance was that rendered by Dr. Wilhelm Fliess, whom Abraham got to know a few years later and for whom he conceived a great regard; it was Fliess who was mainly responsible for his treatment during his last illness," from Ernest Jones's Introduction to *Selected Papers of Karl Abraham*, p. 12. Leonard & Virginia Woolfe, Hogarth Press, London, and the Institute of Psycho-analysis, 1927.

Again in Jones's *Life and Work of Sigmund Freud*, vol. 1, p. 289 (Basic Books, New

stature, but he is treated by the Freudians as Freud was initially treated by his own uninformed contemporaries. From this general indictment I must exempt Fritz Wittels. Of Fliess he wrote: "[er] ist ein geistreicher und spekulativer Kopf, in mehr als einer Hinsicht Freud verwandt." [4]

I will return to Fliess later. For the present I want to revert to Freud's driving ambition to be preeminent—little matter in what—so but he be preeminent.[5]

Freud was lapped in the myth of the hero. There is the apocryphal tale of his birth with a cowl, and the soothsayer's, in this case an old woman's, prediction that he would rise in the world and become a chancelor. Freud himself nurtured the aspirations of an heroic destiny. Long before he had any claim to distinction, Freud wrote seriously concerning his future biographers, and how difficult he was making it for them by destroying all materials bearing upon his intimate life.

Twice in his life he expunged his past. The first time in 1885, and the last in 1907. On two occasions he completely destroyed all his correspondence, notes, diaries and manuscripts.[6] Writing to his betrothed in 1885—Freud was then 29 years of age—he reported the destruction of his private papers, and observed: "I cannot leave here and cannot die before ridding myself of the disturbing thought of who might come by the old papers." "Let the biographers chafe; we won't make it too easy for them. Let each one of them believe he is right in his 'conception of the development of the Hero': Even now I enjoy the thought of how they will all go astray." [7] It is interesting to speculate why Freud was so eager to blot out the past.

There can be little doubt that Freud felt himself heroically predestined and convinced that it was up to him to eventuate this heroic destiny. For that Freud lacked neither energy nor enterprise. Describing Freud's three hospital years—1884-1887—Jones writes: "Freud was constantly occupied with the endeavor to make a name for himself by discovering something important in either clinical or pathological medicine." [8] Jones

York, 1953): "Of those who knew him (Fliess), with the exception of the level-headed Karl Abraham, who was not impressed, everyone speaks of his 'fascinating' personality."

[4] Wittels, Fritz: *Sigmund Freud*. E. P. Tal and Co. Verlag, 1924.

[5] Bernfeld, Siegfried: "Freud's Scientific Beginning," in *The American Imago*, vol. 6, no. 3, Sept., 1949.

[6] Jones, Ernst: *The Life and Work of Sigmund Freud*, vol. I, p. xii. Basic Books, New York, 1953.

[7] *Ibid.*, p. xiii.

[8] *Ibid.*, p. 78.

ascribes this drive to Freud's eagerness to marry " a year or two earlier." But this explanation is not convincing. The simple fact is that Freud was an ambitious man, even unto his old age, and it is quite consistent for an ambitious man to try to make a name for himself.

Before Freud turned to the treatment of nervous and mental diseases he ventured into a number of fields, seeking in each to make a name for himself. He experimented with pharmacological products, he worked in physiology, embryology, in neuroanatomy, dabbled in children's diseases, and tried his skill as a medical compiler, translator, and author. He was competent in each, came close to gaining distinction on several occasions, but attained in none the preeminence he sought and craved.[9]

That came to him only after he had labored long in the treatment of nervous and mental diseases. And here we witness an instance of Freud's great good fortune, for at the beginning of this departure and for many years thereafter, Freud had for friend and mentor the gentle, generous, and ingenious Josef Breuer. The relationship between Breuer and Freud is too well known to require retelling, though it is worth noting that in later years Freud was privately hostile toward Breuer, though publicly he always spoke of Breuer in terms of praise and gratitude.[10]

Freud not infrequently referred to Breuer as the Founder of Psychoanalysis. This, as Jones observes, is an exaggeration. It was an overassessment of Breuer's share, and it is to be seriously doubted if Breuer ever accepted the reference gladly or as a compliment. For Breuer was not sympathetic to Freud's " wild speculations." [11] He was an orthodox scientist, an adherent of the school of Helmholtz, a devotee of Goethe and of Fechner. Yet there can be no doubt that by his participation in Breuer's famous case, Frl. Anna O., Freud was launched on a tangent of curiosity and interest which ultimately led him to the formulation of his theory and system of psychoanalysis. But Breuer disassociated himself from Freud long before the latter had gone far in these directions. And the reason for this was not as it is commonly alleged, that Breuer became

[9] Bernfeld, *op. cit.*

[10] Jones, *op. cit.*, p. 168.

[11] Freud, Sigmund: *Aus den Anfängen der Psychoanalyse, Briefe an Wilhelm Fliess*, p. 18 (Imago Publishing Co., London, 1950): "In einem zufällig erhaltenen Briefe Breuers an Fliess aus dem Sommer 1895, mehrere Monate vor dem Erscheinen der 'Studien über Hysterie' heisst es: 'Freud ist im vollsten Schwung seines Intellekts. Ich sehe ihm schon nach wie die Henne dem Falken.'"

The above quotation is corrupted in the English translation to read, "Freud's intellect is soaring; I struggle along behind him like a hen behind a hawk." Fancy a hen struggling along behind a hawk!

alarmed when Frl. Anna attempted to involve him in some of her sexual fancies, but rather that Breuer could not accept Freud's speculations.

It is this and not specifically Freud's emphasis on the role of sexuality in hysteria that estranged Breuer. Yet the common opinion holds to the contrary and Breuer is made to appear a shy, timid, prudish old maid of a man. Sexuality in hysteria was a secondary factor at issue—the primary one was in the nature of a broad philosophical difference. Freud himself described it clearly in his "Autobiographical Study." [12] The issue between him and Breuer revolved around the problem "when and how do mental processes become pathogenic." Breuer advocated a physiological theory and Freud a psychological. Freud, in his own words, suspected at the root of the pathogenic mental processes the operation of "intentions and purposes such as are to be observed in normal life." It was the thwart and repression of such intentions and purposes that, according to Freud, proved pathogenic. If one but granted that premise, it was incontrovertible that in our society the intentions and purposes of sexuality were subject to the greatest thwart and repression. But the premise was *not* granted, either by Breuer or by the world of science. The premise denied, all that was derived therefrom was likewise denied and rejected. One man in Freud's immediacy, however, did not reject the premise; that man, to Freud's great good fortune, appeared on the scene at just the right time, and that man was Wilhelm Fliess.

But before dealing with Fliess' role in Freud's intellectual development, it is imperative that we grasp in its full import what it was that Freud premised and why it was so grossly rejected and violently opposed. To state the issue bluntly and at its simplest—the imputation to life and to its manifold phenomena of intention and purpose was anathema to all the "best brains" in biology and medicine. Intentions and purposes smacked of vitalism, and reeked of teleology. Life, according to prevailing scientific belief, was to be accounted for in terms of matter and energy, in terms of molecules in motion. Purpose and intention had neither place nor meaning in the realm of science. Yet Freud postulated not molecules and motion but intention and purpose—"such," he added, "as are to be observed in normal life." Is it not understandable then why Brücke, Meynert, and Breuer, those closest to Freud in his student years and during his early manhood, were alienated and aggrieved? Freud had in effect betrayed them. He had renounced their common faith. Brücke, Meynert, and Breuer belonged to the school of von Helmholtz, a school whose

[12] Freud, Sigmund, "An Autobiographical Study," translated by James Strachey in *The Problems of Lay-analysis*. W. W. Norton Co., New York, 1952.

adherents, embracing the outstanding biologists, physiologists, and physicians of the time, were bitterly and aggressively opposed to every theory of biology that posited any factor other than matter and energy.

The most outspoken and belligerent representative of this school of thought was not von Helmholtz, but Emil du Bois-Reymond, the Prussian patriot of French extraction. Brücke was a close friend of du Bois-Reymond. Bernfeld cites a letter written by du Bois-Reymond which contains the following affirmation: " Brücke and I pledged a solemn oath to put into effect this truth: ' No other forces than the common physical-chemical ones are active within the organism. In those cases which cannot at the time be explained by these forces one has either to find the specific way or form of their action by means of the physical-mathematical method or to assume new forces equal in dignity to the chemical-physical forces inherent in matter, reducible to the force of attraction and repulsion.' "

" Intention and purpose " did not belong to that order of forces deemed equal in dignity to the physical-chemical forces. Hence, Freud and his theories were not acceptable among the scientifically orthodox and respectable.

I have quoted Freud's own words on the differences between himself and Breuer, and underscored the words " intention and purpose." From this it might be assumed that in his own mind Freud was clear as to " where he stood and what he intended." But such an assumption would be grossly erroneous. Freud never made a clean break with the school of von Helmholtz, and I doubt that he ever, in the long span of his life, grasped the true issue that separated him from orthodox psychology. Freud was all his life, as Wittels named him, the Antiphilosopher, and " the issue " was in the last analysis philosophical. Freud, to use modern terms, was an ethologist, and an ecological and holistic scientist, *malgré soi*.

Therein lies the wonder and the tragedy of his association with Fliess—a wonder in the effect it had upon his thinking and endeavors, and tragic in the tawdry *finis* that was writ to that friendship. Tragic, too, is the disparagement and calumny heaped upon Fliess' person and memory by the adulating partisans of Freud.

Who was Wilhelm Fliess? Little was known of him before the Fliess letters came to light, and even now there is but scant information about him as a personage. Those who have commented on him, in his relations to Freud, tend to belittle him. Jones is frequently and overtly abusive in his treatment of Fliess. Hence, we not only know little of Fliess but that little which is published is patently derogatory and prejudicial.

The Fliess letters are but half a story. We do not have those written

by Fliess to Freud.[13] Freud destroyed them. Freud would have destroyed his own letters to Fliess, but fortunately they were saved. Unfortunately not all of them are published, nor are those published given in their entirety. Of 284 epistles only 168 have been made public. The explanation that some of the materials have been kept out because their publication would "be inconsistent with professional or personal confidence," leaves one, me at least, unsatisfied and unhappy.

Knowing so very little about Fliess, how are we to gauge his influence upon Freud? The answer is—by internal evidence, that is by the evidence we can gain in a careful scrutiny of Fliess' own thoughts and writings.

Were we to take our cue from Jones and Ernst Kris, Fliess would be written off as a fantastic numerologist, an otherwise gracious, informed, and charming man, but still, one who somehow developed a mathematical monomania. Neither Kris nor Jones have attempted to gain insight into the derivation of this so-called mathematical monomania, nor have they related it to Fliess' other preoccupations, to bisexuality, to right- and left-handedness, to the nasal reflex, to the periodicity of fertility and infertility. Had they troubled to do so in the framework of the requisite historical understanding they could have discovered that collectively all this has meaning and that from this meaning Freud drew deep insight and much inspiration.

What is the commonality, the embracing persuasion of Fliess' endeavors? I am not certain that he ever expressed it as such—but it is unmistakably that of Romantic Medicine. For in Romantic Medicine one finds not only precisely those concerns which Fliess pursued but also the exact counterpart of his own and of Freud's orientation to Nature and to Man. This orientation Freud derived directly from Fliess during the fifteen years of their intimate relation. Freud was not a student of philosophy and there is no evidence to show that he came under the tutorial influence of any one else as schooled and biased in these directions as was Fliess.[14]

It is not possible to expound in this presentation the ample meaning and the historical as well as philosophical significance of Romantic Medicine. More nonsense has been written about Romantic Medicine, especially in the English language, than was ever contained in it. Yet, though indeed Romantic Medicine embraced much flimsy and brain-fevered

[13] Only one brief note has survived.

[14] And as Fliess observed with some pathos: "Mit Freud stand ich jahrelang in freundschaftlichem Verkehr. Ihm habe ich alle meine wissenschaftlichen Gedanken und Keime rückhaltlos anvertraut." *Der Ablauf des Lebens*, p. 583. F. Deuticke, Leipzig und Wien, 1906.

speculations, its fundamental assumptions, derived from the *Naturphilosophie* of Schelling, were not only profoundly penetrating and wise, but are finding validation and support in present-day science and biology.[15]

Here I must content myself in merely highlighting the distinctions, the differences, the antipodal positions of Romantic Medicine, and the medicine so self-consciously triumphant in the days of Fliess and Freud. Recall the affirmations of du Bois-Reymond, who spoke not only for himself and for Brücke, but for the entire of the so-called school of von Helmholtz, that is for the whole of the modern world of science and biology. Du Bois wrote: "No other forces than the common physical-chemical ones are active within the organism." This affirmation, this pledge, made with the pugnacious overtones of a challenge—"and woe to him who does not do likewise" was in effect but the reiteration of the pledged commitment of that science which came into being with the Age of Enlightenment. It was but the echo of the words and persuasions of Condorcet, of Lamettrie, of Holbach. These persuasions are tersely summed up by Ernst Cassirer in the following words: "All the processes of nature, including those commonly called 'intellectual,' the whole physical and moral order of things, are reducible to matter and motion and are completely explicable in terms of these two concepts."[16] In the purview of Lamettrie, the human body is an immense clock constructed with much artifice. In Holbach's *Système de la Nature* it is stipulated that no aspect of nature is to be introduced into the philosophy of nature which is explicable only in terms of man and his appetites and desires. It is the structure of the atoms that forms man, and their motion that propels him forward; conditions not dependent on him determine his nature and direct his fate. In this philosophy of science there is neither place nor acceptance for "intention and purpose," the two factors the misadventures of which are posited by Freud at the root of, as the *fons et origo* of, hysteria and the neuroses.

Lamettrie is usually assessed as an extremist among the philosophers of the Enlightenment, and that is correct. But in his postulates and premises he is in essential agreement with the leading philosophers of his age. The realm of philosophy, however, was not totally under their sway. There was also Leibnitz. And he stood athwart the philosophy of rational-

[15] For a more ample treatment of Romantic Medicine, *vide* Galdston, Iago, "The Romantic Period in Medicine," in *Bulletin of The New York Academy of Medicine*, vol. 32, no. 5, May, 1956.

[16] Cassirer, Ernst: *The Philosophy of the Enlightenment*, translated by Fritz C. A. Koelln and James P. Pettegrove, p. 65. Beacon Press, Boston, 1955.

istic materialism. Leibnitz was born in 1646 and died in 1716. Chronologically, therefore, he belongs to the 17th rather than to the 18th century. But the influence of Leibnitz's philosophy had the character of a delayed action. Its principal theatre of growth and operation was Germany and the Germanic countries, and the growth of German thought was guided by the influence of Leibnitz. The main trend of Leibnitz's thought gained recognition very slowly, but its penetration was nevertheless deep and effective.

What was the main trend of Leibnitz's thought? It can without distortion be summed up in one word "appetency" which can in turn be translated as *desire, appetite, intention, purpose.* This stood in opposition to the rationalistic materialism of the French and English philosophies of the Enlightenment. Perhaps the terms "athwart" and "in opposition" do not correctly define the relation of Leibnitz's philosophy to that of the leading French school. For Leibnitz accepted, in the main, the Cartesian postulates of matter and motion. Where he departed from the Cartesian position, and this departure does in effect equate to an athwart position, amount to this—Leibnitz endowed "matter" with "entelechy." Leibnitz's indivisible units of matter were named by him monads. There is a tendency current to equate them to the atom of present day physics. But the equation is not warranted. Leibnitz's monads were conceived of as units of matter possessed not only of the qualities of extension, impenetrability, gravity, etc., but also of desire, aversion, and memory.[17]

"The monads," as Leibnitz envisaged them, "are the subjects from which all events originate, and the principle of their activity, of their progressive development, is not the connection of causes and effects, but a teleological relationship." [18] Teleology here implies purpose, inward form pressing for realization, and the specific, dynamic, process of becoming, as distinct from that of being.

The concept of inward form pressing for realization inspired a new feeling for nature and deeply influenced the intellectual history of Germany. Its finest form is witnessed in the *Naturphilosophie* that flourished during the latter part of the 18th and the first half of the 19th century.

The span between Leibnitz and Romantic Medicine is bridged by the philosophical contributions of Kant, Fichte, and Schelling. And Schelling was the Prince of the Romanticists. This may be given as the quintessence of the Romanticist's faith, a faith witnessed alike in *Naturphilosophie* and in Romantic Medicine, that the whole of the universe and that of being,

[17] *Ibid.* p. 88.
[18] *Ibid.* p. 83.

human and all other, is bound together in an all-pervading, all-meaningful relatedness, and only in this relatedness is any portion of the total to be comprehended.[19] This does not premise a static relatedness, but rather one of continued becoming. The relatedness of being is in a sustained process of transition toward newer states of being. In the light of this it is understandable how the idea of evolution crystallized in the speculative thinking of the Romanticists. Goethe who must be counted a partisan of the Romanticists, wrote on the metamorphoses of plants, and Lorenz Oken in the last issue of *Isis* (1835) [20] a publication which he founded, sketched a theory on the evolution of man which was substantially validated in Darwin's great work.

I doubt that Fliess would have relished being counted among the Romanticists. Yet it is a fact that in his preoccupations he stands in spiritual and intellectual kinship with the Romanticists. However, those who have treated of Fliess, notably the Freudian authors, would deny him even this much of recognition. They tend to write him off as a " mathematical monomaniac " a deluded numerologist. The derogatory opinions of Aelby to the effect that Fliess " was suffering from over-valuation of an idea " (a charge which could with greater warrant and in many more instances be levelled against Freud), Riebold's characterization of Fliess as " a player with numbers," and Frese's opinion that Fliess' nasal reflex neurosis " verges on the mystical " are cited with seeming relish in patent endorsement.[21] It is not my intention to elaborate a defense of Fliess. But it is my intention to show how little those who are preoccupied with Fliess' so-called numerology understand what Fliess was attempting to establish. In the introduction to his major work *Der Ablauf des Lebens* [22] Fliess wrote:

Very ancient is the question as to which laws determine the course of life. Manifold have been the answers. Belief and scientific notions have alternately ventured as solution. But be it a deity, be it the stars, be it cosmic forces that lie at the

[19] To study nature is to project one's self into, " to sympathize with nature, to trace the likeness between the inner life and the magnets, the crystals, the solar systems, the living creatures of the physical world." Royce, Josiah, *The Spirit of Modern Philosophy*, p. 175. Houghton Mifflin and Co., N. Y., 1931.

[20] 1817-1835: *Isis; oder, Enzyklopaedische Zeitung*, Jena & Leipzig. Edited by L. Oken. Originally a political periodical until 1824, it changed title to *Enzyklopädische Zeitschrift vorzüglich für Naturgeschichte*, etc.

[21] Freud, Sigmund: *Aus den Anfängen der Psychoanalyse. Briefe an Wilhelm Fliess, Abhandlungen und Notizen aus den Jahren 1887-1902*, p. 40. Imago Publishing Co., Ltd., London, 1950.

[22] Fliess, Wilhelm: *Der Ablauf des Lebens. Grundlegung zur exakten Biologie*. F. Deuticke, Leipzig, Wien, 1906.

origin of the weather, be it finally the miracles of germination—in life-, illness-, and death they were ever *external* causes that influenced the living being in a so to say disturbing way. According to what pattern of inner-organization life, not only human, but all earthly life, takes its course, how through this inner organization the generations are linked, and how with no less certainty than the hour of birth is the hour of death predestined—this will be demonstrated in these pages for the first time and in a completely new way. Not through any hypotheses; but solely by means of the most exact, mathematical analysis.

It must be granted forthwith that his "exact mathematical analysis" does not stand up under critical testing. But that does not invalidate his basic hypothesis that "nicht äussere Ursachen" but rather some "innere Ordnung" determine the evolvement and span of life. This is in effect a deep rooted conviction shared by all in the biological sciences. Nor is the possibility to be entirely precluded that some mathematical factor-formula may yet be derived which will prove statistically valid for the *hypothetical* individual.[23]

Fliess' egregious blunder lies in his attempt to postulate a formula precisely applicable to every and any given individual. But Fliess' preoccupation with a mathematical formula to express the *Ablauf des Lebens* must be considered in conjunction with his other interests. Only thuswise can one appreciate his kinship with Romantic Medicine. Fliess was interested in bisexuality, in handedness, in sinistration and dextration, in the problem of mortality and death, in the periodicities of fertility and of sterility, in the relation of the nose to genitality. He anticipated what is currently termed—the rhythm method of contraception. These items not only deeply concerned the partisan of Romantic Medicine but they were indeed at the very core of its dynamic philosophy. Lorenz Oken affirmed it as a cardinal principle—"Erstens liegt allen Gestalten der Natur der Gedanke der Zahl zugrunde."[24] Oken's primal figure was not an integer but rather zero. Rhythm and repetitiveness, the Myth of the Eternal Return, was an essential premise in the philosophy of Romantic Medicine. Novalis wrote: "Insofar as one envisages life as a complete whole, to that extent is it subject to division into periods and epochs. These periods and epochs of life must perforce bear a relationship to one another; for life must exhibit a *rhythmus* in its evolvement, and must express a harmony.[25] This thesis of periodicity is reflected in Fliess' mathematical

[23] Life expectancy at given ages is currently estimated, and accepted.

[24] Leibbrand, Werner: *Romantische Medizin*, p. 65. H. Goverts Verlag, Hamburg und Leipzig, 1937.

[25] Stengel, Gerhard: *Die Deutschen Romantiker*, vol. I, "Die Zahl," p. 623. Verlag Das Berland-Buch, Salzberg, 1954.

calculations. Polarity, the relationship of apposites, was " die eigentliche Lebenslehre der Romantik." [26] This too is reflected in Fliess' theory of bisexuality. In the writings of J. J. Bachofen are to be found precise and specific references to *sinistration* and *dextration* and " die höhere Würde der linken Seite " (the greater dignity of the left side), identical with the ideas propounded by Fliess: The left side belongs to the female, the right side to the male. " In the morals and customs of civil and cultural life, in the peculiarities of attire and grooming, as also in folklore, and no less in the meaning of expressions, the same idea is repeatedly encountered, *major honos laevarum partium*, ' the greater dignity of the left side.' " [27]

In citing these homologues to Fliess' theories, in Romantic Medicine, I have no intention to suggest that Fliess plagiarized the writings of his predecessors. I intend only to define the framework of his thinking and to highlight its kinship with *Naturphilosophie* and Romantic Medicine. Whatever his specific preoccupations, they were set within the matrix of the philosophy of the Romanticists, and from this matrix, through the long enthusiastic and friendly indoctrinations of Freud by Fliess, Freud derived and nurtured his original ideas, which, in time, and *by dint of other labors* yielded his philosohy and system of psychoanalysis.

In the Introduction to the volume of the Fliess letters there is a chapter entitled " Psycho-analysis as an Independent Science." This is a paradoxical affirmation, for it lies in the very nature of a science to *not be* independent, otherwise it cannot be a science but only a mysterium, an esoteric discipline. Yet the intention of the affirmation is transparent. It but reiterates Freud's own claims—that he, and he alone, created psychoanalysis. Historically that is not to be doubted or questioned. But to grasp the full implications of this affirmation one must scrutinize it deeply. It is true that Freud created psychoanalysis but the question remains " out of what." Completely original, that is, virginal creativity is vouchsafed only to the musical and mathematical geniuses. Those in the plastic and graphic arts may in some instances be granted this supreme gift of inventiveness. But no one who contributes to science can be " virginally creative." He can only apply his creative genius to such singular insights as may come to him in the perspective of antecedent knowledges. The independence of Freud, the *Unabhängigkeit* of psychoanalysis, is meaningful and understandable only in the light of the fact that Freud was an autodidact. Freud vigorously intended to be original. He consistently

[26] Hirschfeld, Ernst: " Romantische Medizin," in *Kyklos*, vol. 3, p. 14, Georg Thieme Verlag, Leipzig, 1930.

[27] Stengel, *op. cit.*, p. 640.

abstained (to the extent possible) from acquainting himself with what others had done or had thought before him. He wrote to Fliess, "I do not want to read, because it stirs up too many thoughts and stints me of the satisfaction of discovery." [28] Reading, he discovered that "It is the oldest ideas which are the most useful, as I am belatedly finding out." [29] In another letter he wrote: "What have you got to say to the suggestion that the whole of my brand-new theory of the primary origins of hysteria is already familiar and has been published a hundred times over, through several centuries ago?" [30] Such discoveries disconcerted him. Freud preferred to think first and to "study" later. When he was working on his Dream Interpretation he wrote to Fliess: "First I want to get my own ideas into shape, then I shall make a thorough study of the literature on the subject, and finally make such insertions or revisions as my reading will give rise to. So long as I have not finished my own work I cannot read." [31]

Even so Freud did not and could not have made a thorough study of the dream literature, or he would not have written: "No one has the slightest suspicion that dreams are not nonsense but wish fulfillment." Certainly there were many writers, Novalis, for example, and even more significantly Gotthilf Heinrich von Schubert, who did not think that dreams were "nonsense." Schubert wrote a most penetrating work on dreams entitled *Die Symbolik des Traumes,* wherein he not only anticipated Freud's theories but affirmed that, among other functions, the dream served also that of wish fulfillment.[32]

It is not my intention to set up a gallery of pre-Freudians, nor to challenge in any sense whatsoever Freud's claim to have been the sole and original creator of psychoanalysis. I do intend, however, to underscore the fact that he was an optative autodidact, and that he "discovered" by dint of great labor the components of his metapsychology, which components were already known, and defined, in many respects in superior ways, in Romantic Medicine. That includes his dream interpretation, the Unconscious, repression, the Id, Ego, and Super-ego, the concepts of Eros and Thanatos, and much else beside. I hasten to add, however, that while all these add up to a great portion of Freud's metapsychology, they do

[28] Freud, Sigmund: *The Origins of Psycho-analysis, Letters to Wilhelm Fliess,* translation by Mosbacher and Strachey, p. 126, Letter 29. Basic Books, Inc., New York, 1954.
[29] *Ibid.* p. 157, Letter 41.
[30] *Ibid.* p. 187, Letter 56.
[31] *Ibid.* p. 249, Letter 86.
[32] Schubert, Gotthilf Heinrich von: *Die Symbolik des Traumes,* p. 19. F. A. Brockhaus, 1862.

not add up to psychoanalysis as a psychologic system or as a therapeutic procedure.

Psychoanalysis could not have been conceptualized in Romantic Medicine, nor indeed at any time before the latter part of the nineteenth and the early part of the twentieth century. The reasons for this are not difficult to fathom. They are akin to those reasons which brought forth vitamin therapy in the twentieth century, and not before. Vitamin therapy, as is well known, provides the metabolic mechanism, in the second instance, with that of which it was deprived in the first instance. Until foods were subjected to refinements, that is to devitaminizing processes and to other corrupting influences, there was no compelling necessity for a science of vitamins nor for vitamin therapy. The metapsychology upon which Freud based his psychoanalysis was an integral component of Romantic Medicine, and there was no necessity to extricate it into a separate discipline. That necessity arose only when medicine was subjected to the dismemberment and disorientation it experienced under the influence of the French rationalistic science and in the so-called school of von Helmholtz.

I fear this argument may be misunderstood, that it may be taken for a value judgment rather than as it is intended as the exposition of an historical eventuation. I have a high regard for the philosophical framework of Romantic Medicine but I do not esteem the actualities, i. e., the practice of Romantic Medicine, nearly as high, nor in any respect of effectiveness even remotely proximate to the medicine of today. I am certain, however, that none of the leading personages of the Romantic period—Goethe, Schelling, Carus, Oken, Novalis, Grimm, or Schubert, to name but a few, would find himself otherwise than at home in the labyrinthine metapsychology of psychoanalysis. I do suspect they would find some of it naive, but still very familiar. And as for the neurotic and psychotic patient, I would feel quite secure entrusting his treatment, say, to Schubert or to Damrow.

But to revert to Freud: it appears quite clear to me that in his long and intimate association with Fliess he was indoctrinated in the ideational framework of a relatedness system—closely akin to that of Romantic Medicine, and that within this framework, which he singly and laboriously reconstructed, he worked out both the metapsychology and the operational patterns of psychoanalysis.

The break between Fliess and Freud, no matter how it may have been marked by overt events, took place when Freud, starting off from their commonly shared terrain of ideas and convictions, departed in his unique

direction. Fliess understandably felt abandoned and denied, and he counted Freud an ingrate. Freud on his part was too feverishly preoccupied in the pursuit of his own concerns to allow himself the distractions of a friendship that had already given him its all. But that Fliess had indoctrinated and nurtured Freud in the philosophy of "world and man relatedness," there can be no doubt. Fliess' frustration was in a measure that of the hen that had brooded and hatched a duckling.

Freud, started on the pursuit of his metapsychology, could not and would not be deflected. In December 1897 Freud wrote that he was keenly looking forward to meeting with Fliess "and the fine things you will have to tell me about life and its dependence on the world process. I have always been curious about it, but hitherto I have never found any one who could give me an answer." And to this he added, and not in jest, "If there are now two people, one of whom can say what life is, and the other can say (nearly) what mind is, it is only right that they should see and talk to each other more often." [83] But in March of 1900 Freud was quite of a different mind. He declined Fliess' proposal that they meet at Easter, and gave a motley of explanations for his declinations. "Subtle resolution of contradictions," "inner reasons,—an accumulation of imponderables, which weighed heavily upon him," and so on—all of it adding up to the fact that he had no more use for Fliess. He was henceforth on his own.

There would be little profit in tracing Freud's psychoanalytic architectonics—the sequence in which he constructed his theoretical edifice—Jones has done that laboriously. It *is* of interest, however, to take note that his first, major, and in the opinion of many, his most significant work, was composed when he was still friendly with Fliess. The work was his *Interpretation of Dreams*. How did Freud come to make this study, to compose this work, so substantive in Romantic Medicine? In *Zur Geschichte der Psychoanalytischen Bewegung* [84] Freud states that he came upon dream interpretation "nachdem ich mich, einer dunklen Ahnung folgend, entschlossen hatte die Hypnose mit der freien Assoziation zu vertauschen." ("after I had resolved, following a vague inspiration, to substitute for hypnosis free association.") "My thirst for knowledge," he adds, "had not initially been directed towards the understanding of dreams. I do not know of any influences that directed my interest or gave me helpful expectation."

[83] Freud, Sigmund: *The Origins of Psycho-analysis, Letters to Wilhelm Fliess*, translation by Mosbacher and Strachey, p. 238, Letter 79.

[84] Freud, Sigmund: *Zur Geschichte der Psychoanalytischen Bewegung*, p. 16. Internationaler Psychoanalytischer Verlag, Leipzig, Wien, Zürich, 1924.

One is prompted to wonder—is this but another instance of Freud's amnestic slips? He did praise old Fechner for his understanding of dreams and Fechner, it should be noted, was a distinguished Romantic.

Two items remain to be dealt with: the reaction of the world of science to Freud's theories, and the phenomenal fact that despite great opposition they have substantially "prevailed," that is, they have received discrete, critical, but none-the-less effective acceptance in medicine and in psychiatry. As to the first, the fiction has been propagated that Freud met opposition chiefly because of his sex theories. Essentially this was not the case though it should be added that Freud's "sex theories," on their own, and apart from all other evocative factors, did arouse the sceptical derision of the scientific world. And well they might. The "sexuality" of current day psychoanalysis is quite different from that hypothesized by Freud in the 1890's and early 1900's. Much of that difference is glossed over in the psychoanalytical records of the reception given to Freud's early and initial formulations. But vastly more significant is the historic fact that Freud's theories were opposed and challenged on the score that they were not scientific, that they were wild to the point of being a "bad joke" (P. Janet). Wilfred Trotter wrote: "However much one may be impressed by the greatness of the edifice which Freud has built up, and by the soundness of his architecture, one can scarcely fail, on coming into it from the bracing atmosphere of the biological sciences, to be oppressed by the odour of humanity with which it is pervaded. One finds everywhere a tendency to the acceptance of human standards and even sometimes of human pretensions, which cannot fail to produce a certain uneasiness as to the validity, if not of his doctrines, at any rate of the forms in which they are expounded." [85]

Oswald Bumke wrote: "You may define science as you please. *Psychoanalysis is not natural science nor any kind of science*, nor is it a fairy tale. For unlike the latter, it does not spring from the heart, but rather from a coldly brooding and yet misguided intellect." [86]

Freud's system was indeed not science, as science was then known, but rather "reeked of humanity." It was not science for it dealt with imponderables lacking the accustomed dimensions of the accredited data of science. It reeked of humanity with all of humanity's ephemerities. It treated of hopes, aims, ambitions, goals, frustrations—the subjectivistic

[85] Trotter, Wilfred Batten Lewis: *Instincts of the Herd in Peace and War*, pp. 77-78. Macmillan Co., New York, 1919.

[86] Sachs, Bernard, M. D., "Bumke's Critique of Psychoanalysis" in *Mental Hygiene*, vol. XVI, no. 3, pp. 409-427, July, 1932.

corruptions that encumber the operations of the undisciplined mind—the dross of human mentation which more than a century before had been fused off and discarded as so much slag in the crucibles of science.

Freud himself was cognizant of his scientific apostasy. In his *Introductory Lectures*[87] he warns his auditors that in order to grasp the burden of his intentions they will need, indeed will be required, to shed their indoctrinated and habituated patterns of thinking, perceiving, and testing, and that the very nature of proof in psychoanalysis will be such as must of necessity run contrary to their ingrained expectations.

Freud and his psychoanalysis stood forth as an offense against the objectivity and purity of science, and they were resented deeply and bitterly. And yet, they both prevailed. How many, different, elements entered into the ultimate acceptance of psychoanalysis among the confraternity of learned disciplines, I cannot at this time undertake to catalogue or to describe. Two factors, however, stand forth above all others. Freud's personality, his Promethean drive and obdurate endurance, and, the fundamental pertinence of the reorientation of man to himself, to the experience of growth and development, and to the intricate adventures of living, implicit in Freud's metapsychology, and in much of the technique of psychoanalysis.

It is most questionable whether psychoanalysis as we know it, historically and practically, would have come into being had there not been a Freud to bring it into being. But even at the time of Freud there was more than a nascent suspicion that matter and energy, substance and motion, physics and chemistry, and all the rest in accepted science, would not suffice to explicate all the phenomena and experiences witnessed in life. Indeed science itself had come under scrutiny and its basic assumptions were being challenged by science proper. It is relevant to recall that Michelson's crucial experiment on the velocity of light was made in 1881, and repeated in 1887 and 1905. Einstein wrote his initial work on Relativity in 1905, and the Curies conducted their unique studies on the pitch blende in 1898.

There was prevalent a valence of receptivity for the insight Freud brought to the realm of biology in general, and to psychology in particular. It is understandable that Freud and his partisans underscore the opposition he encountered. Historically, however, the acceptance of his ideas is even more noteworthy, and the acceptance was of no mean proportion. Holt spoke for many of his contemporaries when he said of Freud's work:

[87] Freud, Sigmund: *Introductory Lectures on Psycho-analysis*. English translation by Joan Riviere. London, G. Allen and Unwin, 1922.

"It is the first key which psychology has ever had which fitted." (*The Freudian Wish*). The "key that fits" is a happy phrase. It is the key we name by many names—ecological, holistic, ethological. It is in essence the key to the understanding of the universe and to man's relation to it—the crude blank of which was proffered more than a century ago—in Romantic Medicine.

I cannot terminate this presentation without speculating, however briefly, on what might have been the state of psychiatry today—had Freud never lived and never labored. I am persuaded that while we would not have had psychoanalysis as a discipline and movement, with all that this implies of good and bad, psychiatric knowledge, psychiatric theory, and psychiatric practice would in all vital essentials not have been any different from what they are currently. I am impelled to, but I am not happy, to thus commit myself. I am sure to be misunderstood, and likely to be abused. Oddly enough I could with impunity and general assent say as much about other great personages in the history of science, of say Darwin, or Copernicus. But Freud is quite another matter! He stands unique! That is quite correct and it is precisely the point I want to make. Freud *is* historically unique—*in his personality*. None but Freud could have been Freud. But others could, and most likely would have done the fundamental work, contributed by Freud. Freud has been compared to Darwin, to Newton, and to Copernicus. I concur in these comparisons. Yet to my mind there is but one man he truly resembles—not in any other respect—but in the signature of his personality—that man is Paracelsus. The motto of his life was: *Alterius not sit, qui suus esse potest*. Freud elected no motto, but the one he inscribed on the Frontispiece of his *Interpretation of Dreams* characterizes the passionate ambition that characterizes his life and his work:

FLECTERE SI NEQUEO SUPEROS, ACHERONTA MOVEBO. (Virg.)

("If I cannot influence the gods of heaven, I will stir up Acheron itself.")

I will avail myself of every possible resource to accomplish my purpose.

It is my profound conviction that long after all that is sound and valid in his system of psychoanalysis has been absorbed and incorporated in psychiatry, Freud will be prized and celebrated above all else for the heroic dimensions of his being, for the valiance of his character, and for his Promethean spirit.

THE DEVELOPMENT OF THE MEDICAL UNIVERSITY AT MONTPELLIER TO THE END OF THE FOURTEENTH CENTURY[1]

VERN L. BULLOUGH

It was in Montpellier that medicine first took its place in a university curriculum alongside the arts, philosophy, and law, assuming the position it held in most medieval universities and the one it holds in modern

[1] I am indebted to several previous writers for their work in attempting to give the development of medical education at Montpellier. The pioneer work in medical education is that of Theodor Puschmann, *A History of Medical Education*, translated from the German by Evan H. Hare (London: H. K. Lewis, 1896). Puschmann devotes about eight pages to Montpellier. I am indebted to him for his accounts of the early history of Montpellier. His account of the thirteenth and fourteenth centuries, the most important in my estimation in the formation of the school, is very meager. Another brief description is found in Th. Meyer-Steineg and Karl Sudhoff, *Geschichte der Medizin im Überblick mit Abbildungen* (2d. ed., Jena: Gustav Fischer, 1922). It is valuable for the names of some of the practitioners at Montpellier but adds little to Puschmann's account. An early narrative by Jean Astruc, *Mémoires pour servir à l'histoire de la faculté de médecine de Montpellier* (Paris: P. G. Cavelier, 1767) contains some interesting information but must be checked very closely.

Alexander Charles Germain, *Histoire de la commune de Montpellier*, 3 vols. (Montpellier: Jean Martel Ainé, 1851), gives the early development of the town of Montpellier plus some incidental information on the medical university. Max Neuburger, *Geschichte der Medezin*, 2 vols. (Stuttgart: Ferdinand Enke, 1906-11), is valuable for the identification of various medical writers. Volume one, and part of volume two of this work were translated under the title of *History of Medicine* by Earnest Playfair, 2 vols. (London: Oxford University Press, 1910-1925). It is not very well organized. Stephen d'Irsay, *Histoire des universités Françaises et étrangères des origines à nos jours*, vol. I (Paris: Auguste Picard, 1933) has a brief section on Montpellier and the rise of the medical school as part of his general treatment of the development of the mediaeval university. The most comprehensive account in English is by Sonoma Cooper, "The Medical School of Montpellier in the Fourteenth Century," *Annals of Medical History*, n. s. II (1930), 164-95. It deals with the relationship of the town and university and the effect of the black death. She is concerned with the medical school in the fourteenth century and attempts to explain the reasons for its decline. Anyone dealing with the development of university education in the middle ages owes a debt to Hastings Rashdall for his monumental *The Universities of Europe in the Middle Ages*, new edition by F. M. Powicke and A. B. Emden, 3 vols. (Oxford: Clarendon Press, 1936). Alexander Germain intended to write a comprehensive history of the medical school but never did so. His introductory essay on Montpellier in the *Cartulaire de l'université de Montpellier*, I, published under the auspices of the Conseil Général des facultés de Montpellier (Montpellier: Richard Frères, 1890), proved must valuable. This collection of charters which I have

universities.[2] University as used in this paper is a technical term. It has been defined by Hastings Rashdall and others to mean a corporation or guild in general, *i. e.* a number, a plurality, or an aggregate of persons. Gradually the definition was narrowed until it denoted almost exclusively a learned corporation or society of masters. In its general meaning there might be several universities in the same town, just as there were several craft guilds, and these separate universities of law, medicine, arts, or theology, were each jealous of their corporate life and slow to coalesce into a single one with special faculties. Some of the universities at the beginning of the thirteenth century, however, were called *studia generalia*. This term had a threefold connotation: (1) the school attracted or at least invited students from all parts of Europe and not merely from a particular county or district; (2) it was a place of higher education for one or more of the specialized fields of law, theology, or medicine; (3) the specialized faculty or faculties had a teaching staff of masters. By the end of the fourteenth century the term *universitas* had come to embrace both its older meaning and the idea of *studium generale*.[3]

During the thirteenth century three medical schools in Europe were considered worthy of the title of *studium generale*: Montpellier, Paris, and Bologna. Salerno,[4] which had been the dominant school a century earlier, had been declining and was replaced by these three. It had served as the foundation stone by which medicine came into the university curriculum. Salerno was never technically a *studium generale* until 1290[5] when its reputation was already on the decline.

The origin of the medical school at Montpellier is veiled in obscurity and it is hard to determine just when it began. The first mention of medical study in the city is *c.* 1137 when Adalbert, later Archbishop of Mainz, went to Montpellier to study medicine after having completed the arts course at Paris. He chose Montpellier because "both doctrine and precepts" were taught by physicians who instructed the healthy in hygiene and cured the sick.[6] Another mention of the medical reputation of the

referred to as *Cartulaire* throughout the paper is the basis for my research. Many other famous medical historians such as Sudhoff, Wickersheimer, Friedenwald, and Pansier have contributed valuable monographs to which I have had access. I do not think, however, that any comprehensive attempt to explain the development and the workings of the school has yet been published. This is what I tried to do in this paper.

[2] Stephen d'Irsay, *op. cit.*, I, 110.

[3] Rashdall, *op. cit.*, I, 6-7, 16-17.

[4] For a comprehensive account of Salerno see Paul Oskar Kristeller, "The School of Salerno," *Bulletin of the History of Medicine*, 17 (1945), 138-94.

[5] Salvatore de Renzi, *Collectio Salernitana* (Naples, 1852-59), I, 361-62.

[6] Anselm of Havelberg, *Vita Adelberti II*, in *Bibliotheca Rerum Germanicorum*, ed. P.

city occurred in 1153 when St. Bernard of Clairvaux wrote that the Archbishop of Lyons had put himself under the care of the famous physicians at Montpellier where he had given "all that which he had and that which he did not have" in return for their treatment.[7] John of Salisbury who died towards the end of the twelfth century wrote that students who were considered failures at Paris in philosophy went to Salerno and Montpellier to become students (*clientuli*) of the physicians.[8]

The fame of Montpellier spread and teaching of medicine had become important enough in 1181 to attract the attention of the seigneur of the city, William VIII.[9] He granted all medical teachers the right to teach medicine within his domain regardless of the country of their origin, because to give to a single individual the right of teaching "so excellent a science" would be "too atrocious and too contrary to faith and religion" (*contra fas et pium*).[10] It must be emphasized that this does not imply a definite organization of masters into a medical school but rather that several masters individually engaged in teaching.

Perhaps one reason why Montpellier developed a tradition of medical learning was that, like Salerno, it was a meeting place of several cultures. Benjamin of Tudela, the Jewish traveler who wrote *c.* 1165-71, said that Montpellier was

> . . . a place well situated for commerce. It is about a parasang [approximately three and two-fifths miles] from the sea, and men come for business there from all quarters, from Edom, Ishmael, the land of Algarve [Portugal], Lombardy, the dominion of Rome the Great, from all the land of Egypt, Palestine, Greece, France, Asia, and England. People of all nations are found there doing business through the medium of the Genoese and Pisans. In the city there are Jewish scholars of great eminence, at their head being R. Reuben, son of Todros, R. Nathan, son of Zechariah, and R. Samuel, their chief rabbi, also R. Solomon, and R. Mordecai. . . .[11]

Jaffé (Berlin: Weidmann, 1864-73), III, ll. 799-800, pp. 592-93. See also Louis Dubreuil-Chambardel, *Les médecins dans l'ouest de la France aux XI^e et XII^e siècles* (Paris: Publications de la société française d'histoire de la médecine, II, 1914), pp. 171-72.

[7] St. Bernard, *Epistolae*, in Migne, *Patrologia Latina*, CLXXXII (second series: Paris, Garnier Fratres, 1844-1900), col. 512.

[8] John of Salisbury, *Metalogicon*, ed. Clemens C. I. Webb (Oxford: Clarendon Press, 1929), Bk. i, ch. 4, p. 13.

[9] Montpellier was under the control of the Guillaume (or Guillems) family, vassals of the bishop of Maguelone, until 1204. In that year it passed to Peter II of Aragon through his marriage to the only child of William VIII. It was united to Majorca by James I, son of Peter, and in 1282 the king of Majorca gave homage to the king of France for Montpellier. The French king's control was made complete in 1349 when James III sold Montpellier to Philip VI, and in 1382 it was attached to the royal domain.

[10] *Cartulaire*, I, No. 1, 179-80.

[11] Benjamin of Tudela, *The Itinerary*, ed. and trans. by Marcus Nathan Adler (London:

The school was thus in a geographical position to be influenced by the Moslem schools of Spain, the Jewish schools of southern France at Lunel, Arles, and Narbonne,[12] as well as the Christian school at Salerno. In fact several masters who had studied at Salerno appear in Montpellier in the twelfth century including Bernardus Provinzalis, Matheus Salomon, Benevenutus Hyerosolimitanus, and Gilles de Corbeil.[13] The Jewish influence made itself felt not only through the Jewish masters from Salerno but included Judah ben Tibbon and his son Samuel ben Tibbon who were from the Jewish school at Lunel.[14]

Rashdall, however, argues that the markedly ecclesiastical character of Montpellier's medical school forms an objection to the idea that the earliest medicine in Montpellier might have been influenced by Jewish or Arabic sources.[15] But ecclesiastical control did not exist in the twelfth century as is shown by the secular regulation of William in 1181.[16] In fact it is possible to argue that William's decree was an attempt to attract the Jews and Christians then being forced out of Spain by the Almohades sect. It is known that a great many Jews took temporary refuge in southern France and at Montpellier. The later development of the ecclesiastical character of Montpellier certainly excluded the continued participation of the Jews and may have led to the existence of a separate Jewish medical school at Montpellier.[17]

As the reputation of Montpellier grew, the number of masters and students, especially in medicine, continued to increase and additional regu-

Oxford University Press, 1907), p. 3. Although none of these men are listed as physicians, there were numerous Jewish medical practitioners at Montpellier during this period. Such men as Isaac ben Abraham, his pupil Judah, Jacob ha-Katon, Samuel ibn Tibbon, Judah ben Samuel ibn Tibbon, Moses ibn Tibbon, Jacob ben Machir ibn Tibbon, were practicing and perhaps teaching at Montpellier. See Frederick T. Haneman, "Medicine in Post-Talmudic Times," *The Jewish Encyclopedia* (New York: Funk and Wagnalls Company, 1901-06), VIII, 416.

[12] Rashdall, *op. cit.*, II, 120; *Cartulaire*, I, lxx; Benjamin of Tudela, *op. cit.*, p. 3; Charles Homer Haskins, *The Renaissance of the Twelfth Century* (Cambridge: Harvard University Press, 1928), p. 388.

[13] P. Pansier, "Les maîtres de la faculté de médecine de Montpellier au moyen âge," *Janus*, 9 (1904), 443-51.

[14] *Ibid.*

[15] Rashdall, *op. cit.*, II, 121.

[16] Gaines Post, "Alexander III, the 'Licentia Docendi' and the Rise of the Universities," Charles H. Taylor and John L. La Monte (eds.), *Anniversary Essays in Mediaeval History by Students of Charles Homer Haskins* (Boston: Houghton Mifflin Company, 1929), p. 266.

[17] Ernest Wickersheimer, "La question du Judéo-Arabisme à Montpellier," *Janus*, 21 (1927), 470.

lation became necessary. Montpellier had passed under the jurisdiction of the royal family of Aragon, but they were apparently indifferent to the school. When Peter assumed control of the city in 1204 he ignored the subject in his charter to the city. As a result ecclesiastical authorities stepping into the void became increasingly responsible for the regulation and encouragement of the medical school. The Church's interest in Montpellier increased as the Albigensian heresy grew in southern France. Montpellier became the headquarters for part of the forces directed against the heretics and for Cardinal Jean de St. Paul, legate of the pope in the Albigensian province. Part of the campaign to overcome the heretics was through education. St. Dominic (*c.* 1170-1221) founded the Dominican friars in 1206 specifically to fight heresy by educational methods. The results led to the strengthening of ecclesiastical, and especially papal control, over Montpellier. In the regulations of 1220 the first allusions to a medical university (*universitas medicorum quam discipulorum*) appears along with the mention of a master to preside over this university.[18] The presiding master, or as he later came to be called, the chancellor, was to be named by the bishop of Maguelone together with three masters of the school. These three masters were to include the senior master with two others chosen by him and the bishop.

Besides the rudimentary organization of a university the statutes provided for some regulation of teaching. These give an insight into the gradual development of Montpellier into the famed medical school it was to become. It also shows the increasing power of ecclesiastical authority. No one was to be allowed to teach publicly at Montpellier unless he had been examined and approved by the bishop, on the advise of the other masters. All criminal cases dealing with students or masters were to be judged by the bishop. In the civil cases decided by the chancellor the bishop still acted as a court of appeal. If the see of Maguelone was vacant the prior of St. Firmin, the church where the school held its religious festivals and scholarly ceremonies, was to act instead.

Students and masters were allowed the right to organize (into a university) by the statutes but certain safeguards were to be observed by both groups. No student who had a fee dispute with a master was to be accepted by another master until the matter was resolved nor should any master attempt to attract students from another. To make certain the regulations were followed they were read " publicly and solemnly " at the

[18] *Cartulaire*, I, No. 2, 180-83. This charter was reconfirmed by Gregory IX in 1239, *ibid.*, I, No. 4, 185-86, and Alexander IV in 1258, *ibid.*, I, No. 8, 194-95.

reception of each master and he had to swear to observe them. The regulations were also read to the assembled masters and students at the beginning of every term. To be certain that there would always be a copy of them, three were made, one for the safekeeping of the chancellor, the others to the bishop of Maguelone, and the prior of St. Firmin.

The statutes contained an interesting clause:

> Quando scholaris redit a locis in quibus practicaverit, libere sibi addicat quemcumque voluerit magistrum, dum tamen priori magistro suo non teneatur ratione salarii, vel alterius alicujus rei.[19]

This is the first indication that students were required to gain experience outside of Montpellier before they received the right to practice. Probably the students went and practiced with an older physician during their summer vacations to gain this experience. This was necessary since the medieval medical school was not attached to hospitals as is the case with modern American schools. The provision that the practice be outside Montpellier might well imply that the medical faculty wanted no competition from its students. At any rate this provision appears in later regulations and could well be the beginning of the modern internship.

Even though the regulations were read, conflicting interpretations developed and the bishop of Maguelone was called upon to arbitrate the various claims. His representatives, Petrus de Conchis, prior of the Church of St. Firmin, and Hugo Mancii, a Franciscan friar, investigated and redefined the rights of both masters and students. Their findings led to a series of statutes which were issued in the year 1240.[20] It is in these statutes that the term bachelor of medicine first appears at Montpellier. Apparently the training of medical students became more complicated and time consuming as the school grew to maturity.

To become a bachelor the student had to have spent three-and-a-half years of study in medicine (*audierit medicinam*) at Montpellier or in *alio loco famoso*. Six months of practice outside of Montpellier was again required. The student also had to have his master testify that he was capable of reading in the schools. Even though the medical degree received was that of bachelor it was a graduate degree. The student had to have studied the arts before he could gain entrance to the medical university. If he had obtained an A. M. degree at Paris or some other

[19] *Ibid.*, I, No. 2, 182. It should be mentioned that these statutes distinguish between masters and students only, the term bachelor not appearing until 1240; see below.

[20] *Ibid.*, I, No. 5, 186-90, issued Jan. 14, and 21, 1240, in two parts. Neuburger, *op. cit.*, II, 344, says this was based on previous regulations at Salerno.

equally famous place he could receive his degree after two-and-a-half years of study plus the necessary practice. Apparently not all students who entered the medical school had received their A. M. degree, and for these a year was added to their training. These students undoubtedly had had some arts training.

The prospective bachelor was required to have attended the school of the masters where he was supposed to have taken part in the disputes in order that the masters might know the extent of his medical knowledge. If the residence requirements and other requirements had been met the candidate was then given an examination, probably by the bishop sitting with the masters. They were required to judge the candidate "*sufficientem vel insufficientem.*" The masters were cautioned in the regulations to be honest in their judgment of the candidate for they were not to be moved by animosity or vengeance to prevent the passing of any scholar who was worthy. Neither should they present or pass candidates who were not worthy.

If the student completed the examination successfully he took a public oath that he would lecture for two years at Montpellier before leaving. Special permission to leave, however, could be granted by the bishop. The successful candidate swore he would obey the statutes of the university; he would not reveal any of the secrets of the university; he would refuse to treat anyone afflicted with an acute disease unless he also called a priest; he would not give more than five *solidos* to an innkeeper (*albergario*) for patients treated in his inn. This last indicates that it was possible for a bachelor to practice medicine. It might also indicate that the physicians were not unwilling to pay a fee to the innkeepers at Montpellier who called them to treat patients, and that such fee splitting was condoned. The bachelor vowed also to attend the assemblies *per fidem* held twice a year as close to St. Michael's Day (Sept. 24) and Easter as possible. After taking these oaths the bachelor could then give cursory lectures on theory and practice.[21]

These same statutes give evidence that training beyond the bachelor's degree was available at Montpellier when they stipulate that a master should not present a bachelor who had not read cursorily (*i. e.* lectured)

[21] Cursory (or extraordinary) lectures were delivered in the afternoon by lesser professors and by bachelors who had to lecture before receiving a more advanced degree. Ordinary lectures were the regular and more important ones and were given in the morning by the older and more highly paid professors. The statutes at Montpellier forbade masters to give cursory lectures stating that this was the job of bachelors (*Cartulaire*, I, No. 5, 188).

on a book of theory and one of practice.[22] The name of this degree is not given but more light is thrown on the subject in 1289. In that year the bishop imprisoned the examiners on their refusal to pass a candidate whom he deemed worthy for an advanced degree, indicating that requirements for the degree had not been clearly formulated. The examiners were released when they agreed to pass the student.[23] Further qualifications for an advanced degree were set forth in 1309 by Pope Clement V.[24] Acting with the advice of his physicians and chaplains, including Arnald of Villanova (a Montpellier alumnus), he required a two-thirds majority in the faculty before an advanced degree could be given. Both the term licentiate and master appear in the charter without apparent distinction. Probably the master's degree was conferred at the same time as the license to teach with the requirements for the degrees being the same. Neither degree was necessary to practice medicine, however. The bachelor's degree was the practical degree. Both the licentiate and the master's degrees were teaching ones. Probably as at Paris the license to teach was given by the bishop or the chancellor while the master's degree was given by the masters themselves.[25] This gave both the masters and the bishop some control over teaching and perhaps helped solve future disputes between the masters and the bishop. Montpellier did not give the doctor's degree in medicine until much later. During this period only Bologna gave an M. D. degree[26] but it also gave doctorates in other subjects. The degree of master at Montpellier was equal to that of doctor at Bologna. Generally during the middle ages the term doctor was reserved to doctors of theology.

Five years of study were required for the advanced degrees if the student held an A. M. degree, otherwise six years. Eight months or two summers (*duas estates*) of experience in the actual practice of medicine was also required. Each bachelor presented for the advanced degree was required to have studied a set list of books. Included in the list were several works of Galen, such as: *De complexionibus, De malicia complexionis diverse, De morbo et accidenti, De ingenio sanitatis.* Also

[22] *Ibid.*, I, No. 5, 187.

[23] *Ibid.*, I, No. 19, 209-10.

[24] *Ibid.*, I, No. 25, 219-21.

[25] *Chartularium Universitatis Parisiensis*, edited and annotated by H. Denifle and A. Chatelain (Paris: Ex typis Fratrum Delalain, 1889-97), I, No. 16, 75-76, II, Nos. 918-43, 349-99.

[26] Rashdall, *op. cit.*, I, 235-36. They also gave doctorates in philosophy, astrology, logic, grammar, surgery etc. (*Ibid.*, I, 242.) Apparently most of the medical degrees were doctorates.

required were works of Avicenna [27] or Rhazes,[28] Constantine the African,[29] and Isaac [30] with commentaries. The candidate was to have explained three books including two with commentary and one without commentary (*duos commentatos et unum non commentatum*) selected from among the *Tegni* of Galen,[31] the *Aphorisms* and *Prognostics* of Hippocrates as well as his *De regimine acutorum* or the *Liber febrium* of Isaac or the *Antidotarium*,[32] *De morbo et accidenti* or *De ingenio sanitatis* of Galen. If he had met these requirements the bachelor was then to give two lectures on the theory of medicine and one on its practice after which he was examined on these by the masters. If he could satisfy them on this examination the masters then questioned him further on causes and solutions. If he met all these requirements they then voted on whether the candidate should receive the advanced degree.

During the examinations and voting the masters were cautioned to be just and even tempered.[33] They were warned not to promote a son, grandson, or other close relative ahead of other men unless they were assigned to them in the prescribed order.[34] The order of promotion was to be in the order in which a bachelor completed his requirements, but if the bachelor neglected to give his oath on the appointed day he went to the bottom of the list.[35] Teachers could absent themselves from Montpellier but in order that their absences not penalize their students, eligible bachelors could be presented by another master.[36] It was specifically

[27] His great medical work, the *Canon*, was translated by Gerard of Cremona.

[28] Most of his works were translated into Latin by Gerard of Cremona but his chief work, the *Continens*, was translated by the Jew Faradji ben Salim of Salerno at the instance of Charles of Anjou in 1279.

[29] His many translations of Graeco-Arabic medical writings, some of which he claimed as original, provided the solid body of works which was used at Salerno and then at Montpellier.

[30] Abu Jakub Ishak ben Soleiman el-Israeli (Isaac Judaeus) was an Egyptian Jew who lived in the ninth and early tenth centuries. He wrote two books on diet, one on urines, and one on fevers.

[31] The *Tegni* (Galen's *technē iatrikē*) or *Ars parva* was probably known through the Latin translation of Constantine the African.

[32] The *Antidotarium* was a collection of formulas, antidotes, etc., and as the chief pharmacopeia of the middle ages it was translated into Hebrew, Arabic, Italian, and French. See Sudhoff-Pagel, *Kurzes Handbuch der Geschichte der Medizin* (3rd and 4th ed. Berlin: Karger, 1922), p. 172.

[33] *Cartulaire*, I, No. 68, 357.

[34] *Ibid.*, I, No. 68, 346. This regulation might demonstrate that the masters at Montpellier, unlike those at Paris, were allowed to marry. The fact that they were under ecclesiastical jurisdiction, however, indicates that they were at least members of the minor orders of clergy as all university students were.

[35] *Ibid.*, I, No. 68, 354.

[36] *Ibid.*, I, No. 68, 360.

stated that no person of illigitimate birth was to be promoted.[37] During the examination the bachelors were to reply to the masters in the order of their rank on the faculty. Masters could demand answers to questions at any time within a week but not beyond. If the master put off the date for hearing the answer, the bachelor need not answer him.[38]

The process of receiving a medical degree was an expensive one. As a result there were attempts to limit some of the extra expenses. In 1340 the regulations stated that a promotable bachelor who was a candidate for the master's degree need clothe (*vest*) only one master unless the student had credit of at least seventy pounds (*libras*) in which case he could provide vestments for two. If he had over 100 pounds he could dress as many as he wished and even include a feast as long as he intended no bribery.[39]

As Montpellier continued to grow, its reputation spread so that in 1289 it was officially recognized by Pope Nicholas IV as a *studium generale*, although it had had *de facto* acceptance as one for some time.[40] This same papal decree allowed each of the three faculties at Montpellier (medicine, law, and the arts) to govern itself according to its statutes but gave the bishop of Maguelone the right to require all masters to give public oath to him before allowing them to teach. This ceremony of oath taking at Montpellier was probably equivalent to the licensing ceremony at Paris. This gave the bishop some control over the masters through their oath or license. The masters maintained control through their power of granting the master of medicine degree which allowed entry into their ranks.

By 1340 some uniformity in the regulations of the university was necessary. In that year they were codified into a document known as *Statuta universitatis medicine Montispessulani*.[41] In addition to the degree requirements, already explained, these regulations give some interesting information on the workings of the medieval medical university. The reading master lectured either from the feast of St. Luke (October 18) or All Souls (November 2) to Easter in each school year. Not all masters were reading or regent masters for some were classified as non-regent, apparently a lower category. Perhaps this practice was the same as at

[37] *Ibid.*, I, No. 68. 357. There were exceptions, however, and special dispensations were made (*Ibid.*, I, No. 51, 278-80).

[38] *Ibid.*, I, No. 68, 354-55.

[39] *Ibid.*, I, No. 68, 361.

[40] *Ibid.*, I, No. 20, 210-13. Masters from a *studium generale* usually had the *ius ubique docendi*, a sort of ecumenical teaching right.

[41] *Ibid.*, I, No. 68, 340-68.

Paris where the teachers were divided into two groups. The first group was required to lecture and give demonstrations, giving stability to the school. The second group was composed of those who lectured of their own free will. The former were regent, the latter non-regent.[42] The explanation for this lies in the fact that all masters of medicine in the city were considered part of the university whether they were teaching or practicing. This system allowed for some of the masters to spend their time in practice. Also included in the non-regent masters at Montpellier, at least organizationally, were the bachelors. When a regent changed to non-regent he went to the bottom of the list of non-regent but retained any bachelors studying under him. A non-reading master promoted to regency took his place in the seniority lists.[43] Evidently change between the two categories was not too difficult for the full fledged master of medicine.

Bachelors were to be distributed among the masters on the basis of two for each reading master to one for the non-reading master. In order to avoid contention bachelors were to be assigned according to statute. Each reading master, starting with the eldest and going down to the youngest, was to be assigned a bachelor. If there were other bachelors desiring to study, each non-regent master was assigned a bachelor on the basis of his seniority. Any remaining bachelors were again distributed to the reading masters. This assigning procedure was then repeated until the supply of bachelors was exhausted.[44] When a bachelor took a course from a non-regent master half of his twenty *solidi* fee went to the university instead of all to the master which was evidently the case if he was regent.[45]

The necessary business of the faculty was conducted in assemblies held twice a year—at the beginning and end of the masters' lecturing period.[46] At the first of the assemblies, held approximately at the time of the feast of St. Michael (Sept. 29), the masters agreed upon the courses they were to give during the coming year.[47] The method of determining the courses was set by regulation with the eldest master choosing first the book he wanted to give ordinary lectures on followed by the junior master, next senior, next junior, *et. al.* until all the masters had been assigned.[48] The books were to be selected from the following list and each set was to be lectured on for one course. The list included:

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[42] Puschmann, *op. cit.*, pp. 229-230. See also *Chartularium Universitatis Parisiensis*, I, No. 461, 531, III, No. 1540, 448, III, No. 1603, 550-51, IV, No. 1795, 78-80.

[43] *Cartulaire*, I, No. 68, 345-46.

[44] *Ibid.*, I, No. 68, 344-45.

[45] *Ibid.*, I, No. 68, 352-53.

[46] *Ibid.*, I, No. 68, 342-43.

[47] *Ibid.*, I, No. 68, 348.

[48] *Ibid.*, I, No. 68, 346-47.

1) the first book of the *Canon* of Avicenna; 2) *Liber de morbo et accidenti* and *De differentiis febrium* of Galen; 3) Galen's *Liber de crisi et criticis diebus* and *De malicia complexionis diverse;* 4) Galen's *De simplicibus medicinis* and *De complexionibus;* 5) Hippocrates' *Aphorisms* and *De regimine acutorum* or *De prognosticis;* 6) Galen's *De juvamentis membrorum* and *De interioribus;* 7) *De igenio sanitatis* and *De arte curativa ad Glauconem* of Galen; 8) Avicenna's fourth book of the *Canon* (the first two sections) or, together with Johannitius,[49] *De pulsibus* and Theophilus, *De urinis;*[50] 9) Galen's *Tegni* with the *Prognostics* of Hippocrates or his *De regimine acutorum*; 10) Galen's *De regimine sanitatis* and *De virtutibus naturalibus.*[51] If this list was not sufficient for all the masters wishing to read in the schools, other courses could be chosen from: *De febribus* or *De dietis universalibus* of Isaac; the third and fourth fens[52] of the fourth book of Avicenna's *Canon* or other sections; the third book of the *Canon,* or other books of Galen, and so on until there were sufficient courses.[53]

Narrow specialization was to be avoided among professors. It was therefore stipulated that a professor could not repeat lectures on a book until after a five year interval.[54] The newest masters were required to lecture during the first hour for the first five years of their lectureship but senior masters could lecture either during the first or second hour, or, even during vespers, but once they had chosen their hour they were not permitted to change it for that year.[55] Not all the books were available for purchase and a university regulation required any master or student (*scholaris*) having an "authentic" book of medicine which others did not have or could not buy to lend it when it was needed. The borrower had to give a pledge for the book to the owner and return it in good condition.[56] Each day all masters and students were required to attend mass under penalty of fine,[57] proof that by 1340 only Christians could attend the university.

[49] Honein ben Ishak, Latinized Johannitius, the author of an "Introduction" (*Isagoge*).

[50] Theophilus is believed to be Theophilus Protospatharius who held office under the Byzantine emperor Heraclius (610-41) and whose work on urine was well known in a Latin translation. *De pulsibus* might refer to the work by Philaretus but the wording of the document is not clear. There also exists a work on pulse by Theophilus himself. See Neuburger II, *op. cit.*, 120.

[51] *Cartulaire*, I, No. 68, 346-47.

[52] A fen is a section of a book. It is a term apparently used only in the works of Avicenna.

[53] *Ibid.*

[54] *Ibid.*, I, No. 68, 348.

[55] *Ibid.*, I, No. 68, 348.

[56] *Ibid.*, I, No. 5, 189.

[57] *Ibid.*, I, No. 68, 341.

Attendance was not kept in classes but in order to make certain that resident requirements were met students were required to record the date of their entrance and departure from the university. This enabled the student to state definitely how long he had studied at Montpeller " without fraud." For the privilege of registering the student paid two *denarii* at the beginning of the year and four at the end, and no more.[58] If he was a new student coming to Montpellier for the first time the scholar had to swear within eight days after his arrival to observe and uphold the statutes of the university.[59]

The medical student was limited to medical subjects when he studied in the medical university. To enforce this limitation the statutes stipulated that no book on grammar, logic, or natural science, except for Aristotle's *De animalibus,* was permitted to be read.[60] For those students who entered the school without a master of arts degree it was specifically forbidden to receive the arts degree after they had received the medical degree.[61] The intent of this regulation was undoubtedly to preserve the idea of the superiority of the medical faculty to that of the arts.

Bachelors could give lectures during the period when the regent masters were not lecturing.[62] Since the period open to the bachelors corresponded to the summer vacation, attendance was probably limited to students who were not yet ready to practice outside Montpellier as part of their degree requirement. At Montpellier the summer vacation lasted from the Kalends of July to the Assumption of the Virgin (August 15) [63] although the masters were only required to give lectures through to Easter.

Control of the licensing at Montpellier, as it was in other universities, was in the hands of the bishop and his chancellor although the consent of masters was also required. The chancellor at Montpellier was an elected official, chosen by the votes of the faculty. He was required to gain a two-thirds majority.[64] The chancellor was to represent the bishop and act as his lieutenant at all university functions. Assisting the chancellor was an official known as a dean. This office had been foreshadowed in the Charter of Conrad which had given the oldest master precedence in all the scholarly ceremonies with the right to decide on

[58] *Ibid.*, I, No. 68, 351.
[59] *Ibid.*, I, No. 68, 343.
[60] *Ibid.*, I, No. 68, 350.
[61] *Ibid.*, I, No. 68, 364.
[62] *Ibid.*, I, No. 68, 350.
[63] *Ibid.*, I, No. 68, 350.
[64] *Ibid.*, I, No. 26, 222-23.

such matters as vacations, etc.[65] The duty and office of the dean were defined in the statutes of 1340 as those of the functioning head of the medical university.[66] At this late date the office was still held by the oldest master in terms of the number of years taught. The chancellor and dean were assisted by a beadle who reported to them daily. The beadle was an elected official who saw to it that the calendar of the school was carried out as it was planned by the dean. He purchased books and sold or rented them to the students but he was not allowed to have a monopoly. He had to arrange for the examination of candidates for degrees and other such matters. For carrying out these duties he was paid twelve *denarii* a year by each student and two *solidi* by each bachelor.[67] The finances of the university were handled by an officer known as a proctor. This office circulated among the various masters.[68]

The list of texts used at the university gives some indication of what was taught but it does not indicate what methods were used. One of the points of dispute is whether anatomical demonstrations were used. Probably Arnald of Villanova had taught anatomy at Montpellier through the use of diagrams,[69] but actual human dissection is not stipulated until 1340. The statutes in that year order the chancellor to see that an anatomy on a *corporalis* was performed every two years.[70] This regulation was amplified in 1376 when Duke Louis of Anjou gave the medical faculty authorization to do dissections upon the cadavers of executed prisoners.[71] Evidently the royal judges did not deliver the bodies for in 1377 Charles the Bad, King of Navarre, at the request of his physician François Cunil, who was also a member of the faculty, again ordered the officials to deliver the bodies of those executed.[72] In 1396 Charles VI of France found it necessary to repeat this order,[73] and the chancellor presented the demand to the officials of Montpellier.[74] If the requirements for dissections of 1340 were not carried out the later ones probably were. Thus Montpellier

[65] *Ibid.*, I, No. 2, 180-82.

[66] *Ibid.*, I, No. 68, 341-42. I hope to explain this office in greater detail in a paper on the University of Paris where considerable more information is available.

[67] *Ibid.*, I, No. 68, 364-67.

[68] *Ibid.*, I, No. 68, 343.

[69] Charles Singer, *The Evolution of Anatomy* (Fitzpatrick Lectures 1923-24, London: Kegan Paul, Trench, Trubner & Co., Ltd., 1925), p. 72.

[70] *Cartulaire*, I, No. 68, 344.

[71] *Ibid.*, I, No. 162, 569-71.

[72] *Ibid.*, I, No. 163, 572-73.

[73] *Ibid.*, I, No. 192, 678-80.

[74] *Ibid.*, I, No. 193, 680-81.

appears to be the first French school to engage in the study of human anatomy through dissections.

The course of surgical study at Montpellier is more difficult to follow than that of medicine. When Guy de Sora, the legate of Pope Gregory IX, confirmed the medical university statutes in 1239, he excluded the surgeons from following the regulations (*exceptis cirurgicis, quos huic nolumus examini subjacere*).[75] The mention of surgeons and their exemption from the examination indicates what in fact was true, namely the separate development of surgery and medicine at Montpellier. The next mention of surgery in the university regulations occurred in 1399 when Charles VI forbade the practice of surgery to anyone, Christian or Jew, who had not proved himself qualified before a group of masters assembled to examine him. An exception was given to those surgeons who were members of the university faculty,[76] evidence that there were surgeons who held a medical degree. Further proof of this is given by the physician and surgeon Guy de Chauliac who took a medical degree at the University of Montpellier and studied surgery while there. Guy's master at the university, Raymond de Molieres, had also taught surgery.[77] There was, however, not a special surgical degree in the fourteenth century at Montpellier, nor did the university title of master in surgery exist.[78]

The development of surgical education at Montpellier between 1239 and 1399 must remain speculative and incomplete because of the lack of documentation. Surgery was taught at Montpellier but probably most of the teachers were outside of the official university.[79] Evidently many of the surgeons at Montpellier were Jews as is indicated in the regulation of 1399,[80] and possibly some of these acted as teachers but outside of the medical university. In the fifteenth century a master of medicine was forbidden to practice surgery,[81] although such was not the case earlier. Other than this there was apparently little connection between the study of medicine and surgery at Montpellier. Each pursued a more or less independent course.

Towards the end of the fourteenth century a new factor entered the educational picture at Montpellier: the medical college. Pope Urban V,

[75] *Ibid.*, I, No. 4, 186.
[76] *Ibid.*, I, No. 194, 682-83.
[77] Guy de Chauliac, *La grande chirurgie*, translated into French by E. Nicaise with an historical introduction (Paris: Félix Alcan, 1890), p. liii.
[78] *Ibid.* I could not find such a title in an examination of the various documents.
[79] *Ibid.*
[80] *Cartulaire*, I, No. 194, 682-83.
[81] Chauliac, *op. cit.*, p. liii.

who had been a law student at Montpellier in his youth, founded a college for medical students in 1369. Commonly called the *Collège des Douze Médecins* but also known by several other names,[82] it provided for twelve students in medicine. The college was given considerable revenues plus a house on the street of St. Matthew. It was the first college to be limited to medical students. It assured monetary aid to those students who could meet its requirements. The primary stipulation was that the student should be a native of the Diocese of Mende.[83] This college might be called the beginning of scholarship aid to medical students.

Montpellier by the end of the fourteenth century had more or less perfected its organization. Its curriculum was now based on the recovered Greek and Arabic medical classics, more so than at some of its rival universities. Medicine was now considered a graduate study with some arts training a pre-requisite. Practical experience in the form of internship was required. The period between the bachelor and licentiate or master's degree might be compared to the modern practice of serving as a resident in a hospital. Anatomy was apparently taught by actual dissection but surgery and medicine were taking separate paths, a development that was common in all but the Italian universities. The importance of Montpellier lies in the fact that here medicine gave rise to the concept of a modern university and medicine was put alongside other schools in the university curriculum. An understanding of the development of Montpellier also gives some indication of how and why some of our present academic traditions developed .

[82] Astruc, *op. cit.*, pp. 79-81.
[83] *Cartulaire*, I, Nos. 150, 151, 152, 551-56.

VAN HELMONT'S IDEAS ON GASTRIC DIGESTION AND THE GASTRIC ACID

WALTER PAGEL

In Van Helmont's doctrine of digestion two main topics emerge which require separate clarification: first, digestion in general, and second, gastric digestion. Digestion in general ("fermentation") has been admirably treated by Multhauf [1] who also covered much of the ground relating to gastric digestion. In this, however, Van Helmont's personal achievement still seems to deserve a sharper definition than has hitherto been attempted in the extensive literature including the present author's contributions to this subject.[2] In contrast to the traditional Galenic doctrines on the one hand and to Paracelsus on the other, Van Helmont not only discovered acid to be the digestive factor in the stomach of man and animals, but also indicated its nature in distinct chemical terms. It is suggested that Van Helmont had knowledge of *hydrochloric acid* to be this digestive principle.

I

First it may be permitted to survey his treatise: "Heat does not digest efficiently, but excitingly." [3] The title fails to do justice to the contents.[4] For in the treatise not only is heat rejected, but also acid established as the digestive principle.

(1) The primary fallacy which led to the consideration of heat in this respect Van Helmont sees in the observation of the softening of meat by cooking.[5] In this, Van Helmont says, it escaped the observer that cooking leaves the ground structure of meat unchanged—in contrast to true

[1] Multhauf, Rob. P., J. B. Van Helmont's Reformation of the Galenic Doctrine of Digestion, *Bull. Hist. Med.*, 1955, 29: 154-163.

[2] For example more recently in *Bull. Hist. Med.*, 1955, 29: 563-568.

[3] English translation in *Oriatrike or Physick Refined*, by J. Chandler, London, 1662, pp. 198-203. "Calor efficienter non digerit sed tantum excitative." 1st edit. in *Ortus medicinae*, Amsterod, 1648, pp. 201-206. *Opera omnia*, Francof. 1707, pp. 192-197. German translation by Knorr von Rosenroth in *Aufgang der Artzney-Kunst*, Sultzbach, 1683, pp. 253-259.

[4] This may be the reason why this treatise has not had as much attention in discussions of our problem as it should have had.

[5] Cap. 2.

digestion. This involves a deep and true transmutation of an object which no heat even of the highest degree can bring about.[6]

Fishes, devoid of animal heat, have a most effective digestion. As the latter is attributed to "actual," i. e. perceptible heat, no resort can be had to any "potential" heat in order to explain this. In a process as real as digestion, there is either an "actual" power at work or none at all.[7]

Heat is a general factor—its action is the same wherever applied. It therefore provides no explanation for products and results as diversified as those of digestion. Thus the venous blood formed from the digested food in one animal species widely differs from the blood in another. How could heat account for such basic differences? They can only be explained in terms of a multiplicity of "formal properties," each belonging to the stomach of one species or perhaps even one individual.[8]

Were heat really significant, digestion should work more efficiently in fever, which is not the case. Nor is there any trace of digestion in food brought into close contact with a warm surface, for example the skin. Instead of being digested it putrifies.[9]

(2) The true factor of digestion, however, is revealed by certain positive observations:

(a) Glass swallowed by hens has lost its sharp edges when recovered from the stomach of those which died soon afterwards, whereas it has been disposed of completely in the survivors killed at a later date. As glass resists even acids dissolving metal, a particularly powerful agent must have been at work in the stomach of these animals. It can be neutralised by such material as tiles or bricks, chalk or clay—for only this will give relief to many birds that "are ill at ease through the multitude of sharpness."[10] It should therefore be a strong acid. This is borne out by the following observations:

(b) Van Helmont still in his boyhood played about with sparrows. Once—as it often happens to children doing so—a sparrow got hold of his tongue and Van Helmont noticed the intense acidity prevailing in the throat of the bird. It was to this that he immediately attributed the greediness and good digestion of these birds.[11]

(c) Once a "sharp distilled liquor of Sulphur" reduced the fabric of a glove to a juice at those places with which it had come into contact.[12]

[6] Cap. 8-10.
[7] Cap. 11-12.
[8] Cap. 14-15.
[9] Cap. 18.
[10] Cap. 22.
[11] Cap. 23.
[12] Cap. 24.

(d) He noted the appetising and digestive effect of "all things sharp" such as oil of unripe olives, vinegar, lemon and orange juice and mustard. To these must be added in particular salt and saltpetre—"as it hath a spirit in it that causeth hunger (*spiritus esurinus*) and most pleasingly sharp." [13]

Thus, already as a young boy, Van Helmont learnt that a certain acidity effecting true transmutation is responsible for gastric digestion.

(3) Yet it is not acidity as such. For neither vinegar nor lemon juice nor leavened flour will digest food. Moreover, there are almost specific incompatibilities of certain food stuffs with individuals as well as species (mice and swine will not eat beans, the falcon refuses bread; some people cannot digest cheese, wine or milk).[14]

Hence it is a specific "essential" and "vital" acidity—a property that varies with the individual and species.[15] Van Helmont in order to emphasise the special nature of this and similar transforming agents calls them "ferments." [16]

To Van Helmont the "ferment" of the stomach, though ultimately a product of the spleen,[17] has nothing to do with "black bile," the "melancholious sour and black excrement" of the ancients—in their opinion a derivative of this organ. This is a pathological product, reputed to be the main constituent of black vomit—thus far removed from the vital digesting "ferment" of the stomach in dignity and function.

II

Like most of Van Helmont's treatises the essay just analysed consists of a polemical part directed against the traditional ancient doctrine followed by a report of Van Helmont's original observations and doctrine. In the present treatise the traditional attribution of digestion to heat forms the principal target of his polemics.

(1) Galen taught that digestion consists in "concoction," a process

[13] Cap. 24.

[14] Chandler's translation of this passage: "For Mice, Dormice and Swine do sooner perish with hunger than they do eat of a Ring Dove or Wood Culver" (cap. 26; p. 201) is at variance with the original Latin—*phaseolus*—bean.

[15] "Fermentum ergo digestivum, est proprietas essentialis consistens in vitali quadam aciditate, ad transmutationes potens: ideoque et specificae proprietatis" (cap. 28).

[16] "Eamque (sc. the "facultas quaedam vitalis") fermentorum nomine designavi. Sunt autem plura fermenta in nobis" (cap. 29).

[17] As demonstrated (a) by its occasional absence from the stomach, (b) by the topographical closeness of spleen and stomach in hens—i. e. animals with particularly energetic digestion (cap. 30).

rendering food assimilable, i. e. identical with the nature—"proper quality"—of the body to be nourished. This change is most effectively brought about by heat.[18]

Concoction is thus more than mere conversion of food into a fluid from which it is just as different as nutrition from mere blood formation.[19]

"Concoction" rather than mere "chylification" must have been accomplished before the contents are allowed to leave the stomach.

The heat necessary for gastric digestion is chiefly engendered by the organs closely surrounding the stomach like foci of fire underneath a large vessel.[20]

What is sharp and acid contracts the stomach and may thus help digestion by inducing the organ to retain and digest food for a longer time and more thoroughly than normal.[21] Black bile that is acid [22] and excreted by the spleen into the gut and stomach can therefore promote gastric digestion.[23]

Acid is also said to have the power of fermentation.[24] In pathological conditions abnormal cold causes food to turn acid, whereas abnormal heat makes it vaporous.[25]

Comparing Van Helmont's new doctrine with the genuine teaching of Galen we may conclude:

To Galen heat is indeed the agent accounting for gastric digestion. It can be supported by an acid humour—black bile—coming to the stomach from the spleen.

To Van Helmont acid is the agent operative in gastric digestion. It is supported by heat. The acid of the stomach is a "ferment" specific to species and individual—unlike heat which is a non-specific force of which all species and individuals partake in a uniform manner. Gastric acid is

[18] Galen, "De natural. facult." lib. II, cap. 4; ed. Kühn, vol. II, p. 89. See also "De symptomat. differentiis," cap. 4; ed. Kühn, vol. VII, p. 66.

[19] "De natural. facult." lib. III, cap. 4; ed. Kühn, vol. II, p. 155: "Concoction" is "πέψις," conversion into fluid (chyle) "χύλωσις."

[20] "De natural. facult.," lib. III, cap. 7; ed. Kühn, vol. II, p. 164. Here, the arguments of Asclepiades and Erasistratus against chylification of food and digestive action of heat in the stomach are refuted (*ibid.* p. 165-7). See to this Multhauf's comment, *loc. cit.* p. 157.

[21] "De usu partium," lib. V, cap. 4; ed. Kühn, vol. III, p. 361-2.

[22] "De simpl. medicam. temper. et facult.," lib. IV, cap. 16; ed. Kühn, vol. XI, p. 675; also "Definit. med.," LXV; ed. Kühn, vol. XIX, p. 364; "De humoribus," ed. Kühn, vol. XIX, p. 490.

[23] *Loc. cit.* in footnote 21.

[24] "De simpl. medicam. temperam. et facult.," lib. I, cap. 39; ed. Kühn, vol. XI, p. 453.

[25] "De locis affectis," lib. I, cap. 4; ed. Kühn, vol. VIII, p. 37.

fundamentally different from black bile—a mere excrement or pathological product that is devoid of any function. Yet the digestive power of the stomach is ultimately derived from the spleen to which Van Helmont attributed vital functions exercised in close cooperation with the stomach (*Duumviratus*).

Therefore briefly: to Galen heat is the digestive agent in the stomach, supported by acid, to Van Helmont it is an acid, supported by heat.

(2) The original Galenic idea was modified by Fernel from whose "Physiologia" a summary may be derived of the traditional opinion ruling at Van Helmont's time. Fernel [26] says that owing to the stomach's faculty of concoction the food is changed by the action of innate heat and spirit, the heat being engendered and preserved by the liver, spleen, heart, diaphragm, vena cava and omentum which surround the stomach closely. In addition to these common and known qualities, however, there is a specific "silent and recondite" property intrinsic to the gastric substance which achieves concoction. In this process the stomach first reduces the food to small fragments, joining the dry and the moist and converting it into one homogeneous fluid mass (*cremor*). This first stage may be attributed to heat alone—but it is not digestion ("concoction") proper, for this requires conversion into chylus which is able to be assimilated and nourish the animal. It is achieved by the substance of the stomach as a whole.[27]

The specific nature of gastric digestion emerges from the ostrich's ability to digest iron—which the lion's heat cannot emulate, nor even the heat of fire. Similarly tiny birds master the hardest grain which man would hardly dare to tackle, and quails digest hellebore—insuperably poisonous to man.

Digestion thus is more than Aristotle's *elixatio*,[28] i. e. liquefaction and is far removed from putrefaction.

In Fernel's account heat is thus deprived of the sovereign position which Galen had assigned to it. It still occupies a high rank, however, as the factor responsible for the first stage of digestion, the liquefaction of the food. But "concoction" of the latter is now attributed to a specific though undefined quality of the stomach which explains the differences in the quality and intensity of gastric digestion between various species.

[26] Physiologia, lib. VI, cap. 1: Alimenti in ventriculo confectio. *Universa medicina*, ed. J. et O. Heurnius. Traj. ad Rhenum 1656, p. 128.

[27] "Fit autem haec (i. e. mutatio et in chylum conversio) non modo vi et ardore caloris, sed etiam tota ventriculi substantia et insita quam diximus proprietate," *ibid.* p. 128.

[28] ἕψησις (*hepsesis*). Aristotle *Meteorologica*, lib. IV, cap. 2; ed. Bekker, Oxon., 1837, p. 102.

Fernel has thus forestalled some of Van Helmont's criticism of the Galenic theory. Yet Van Helmont's refutation of heat as the digestive agent holds good against the first part of Fernel's theory. In its second part Van Helmont substitutes for Fernel's undefined "occult quality"[29] a well defined chemical substance, namely *acid*.

Fernel mentions that the spleen uses black bile for its nutrition and discharges superfluous material into the mouth of the stomach.[30] He regards black bile as a most potent "pernicious and malignant" sharp humour. When brought into contact with earth it effervesces like a ferment and disrupts the ground just as it erodes and ulcerates flesh.[31] That "black bile" is an adjuvant of gastric digestion, however, the present author was unable to find in this passage of Fernel's work.

Van Helmont vigorously opposes Fernel's idea that black bile should rank with the "ferments" which are able to corrode and blow up earth under effervescence. An inert faeculent excrement such as the "black bile" of the "schools" cannot possibly be credited with such a powerful action as displayed by "aqua fortis" or other acid salt spirits.[32] Nor is earth fermentable at all. It is dissolved but not "fermented" by strong acid. Galen had knowledge of his fictitious humours and excrements, but not of acids (aqua fortis) or ferments.[33]

In conclusion: the undefined "occult quality" which Fernel regards as the digestive factor in the stomach is shown by Van Helmont to be a well defined chemical substance, namely an acid.

(3) Finally we have to outline briefly Van Helmont's position in relation to Paracelsus. The latter is self-contradictory on several counts,[34] but knew acid (for example in mineral waters) to be a powerful adjuvant of gastric digestion. He also credited it with preventive action against the stone. The same acids—the "appetising acids," acetosa esurina—he regarded as the normal digestive factor in those animals which, like the ostrich, are able to digest metal.[35]

[29] Invoked before by Reuchlin and Agrippa of Nettesheym. See the epilogue below.

[30] Physiologia, lib. I, cap. VII. *Universa medicina*, ed. Heurnius. Traj. a. R., 1656, 1 p. 21.

[31] *Ibid.* lib. VI, cap. 9, De humorum differentiis, p. 147.

[32] *Dageraad ofte Nieuwe Opkomst der Geneeskonst*, Rotterdam, 1660, p. 58 (treatise: "De Uytwerckinge van Zaden").

[33] "Scholarum humoristarum passiva deceptio," cap. 1, 78; *Opera omnia*, ed. Francof., 1707, vol. II, p. 169; *Oriatrike*, p. 1029. See Multhauf's comment to this passage, *loc cit.* p. 162.

[34] See for detail the present author, *Bull. Hist. Med.* 1955, 29: 564-566.

[35] "Das Buch von den tartarischen Krankheiten" (1537/38), cap. 16, Huser fol. ed., vol. I, p. 309.

In the treatise analysed in the present paper Van Helmont adopts the *acetosum esurinum* from Paracelsus. To Van Helmont it is the agent to which the pleasant stimulating action on the appetite of lemon juice, oranges, pomegranates, unripe olives, tartar, vinegar, salt, saltpetre, berbery, vine brand, mustard and other *stomachica* is due.[36] *Acidum esurinum* is the acid endowed with the specific digesting effect in the stomach, in contrast to other acids such as vinegar which are devoid of this effect.[37]

It is true that Van Helmont fails to give Paracelsus as his source in this treatise, but he does so in his essay on Spa water in which the *acidum esurinum* is described as a constituent of mineral water accounting for its delicious taste and preventive action against stone.[38] Although gastric digestion is not mentioned in this context, it is in his later work "On Stone."[39]

In conclusion: Van Helmont rejects those parts of the work of Paracelsus in which the latter retains the Galenic idea of the "heat of digestion" and suggests a harmful action of acid in gastric digestion causing stone.[40] He adopts the Paracelsian term and idea of the *Acidum esurinum*, the "hungry acid." Paracelsus, however, regarded the latter as operative only in certain animals and after the intake of acid *stomachica*. By contrast, Van Helmont discovers this acid to be the digestive principle in *all* animals and in man. Moreover, he regarded it as a specific agent, different from other acids and peculiar to the stomach.

III

From all this Van Helmont indeed emerges as the discoverer of acid gastric digestion.

We may well ask: had Van Helmont any idea of the chemical nature of gastric acid? Explicitly he only says that it is a particular acid specifically destined for the purpose of digestion in the stomach. Is it possible to get farther by taking into account his work as a whole and, as it were, by reading between the lines—with a view to indicating more distinctly what kind of acid Van Helmont had in mind?

To answer this question we refer to the passage from the Dutch version of Van Helmont's work which we quoted above. In this Van Helmont

[36] "Calor non efficienter digerit," cap. 24.
[37] *Ibid.* cap. 26.
[38] "De Spadanis fontibus," parad. tert., cap. 10 et seq.
[39] "De lithiasi," cap. III, 24, and IV, 25.
[40] See the present author, *Bull. Hist. Med.* 1955, 29: 565.

militates against the opinion that the acid matter in the stomach is the "black bile" of the ancients and that the latter is the agent causing melancholia. Nor would any explosive reaction occur when "black bile" was poured on the ground, as suggested by "The Schools." [41] Had they, however, poured "aqua fortis or other salt-acid-spirits (*Saltzsaure Geister*) on the ground, they would have seen how the earth blew up and effervesced. They should have been amazed at melancholy finding access to aqua fortis." [42]

Accordingly, the strong acidity of material retained in the stomach for a long time is due to strong aqua fortis generated in us and accumulating in the gastric contents.[43]

These and similar passages summarise Van Helmont's ideas of gastric digestion as due to "fermental" action. They are found in his treatise: "The Image of the Ferment begets the Masse with Child of a Seed." [44]

Mention is also made of the pleasing and appetising effect of sea-salt attributed to its intrinsic acidity.[45] In several other places Van Helmont refers to the beneficial—acid—action of salt. Thus, an acid salt is formed in the stomach.[46] It is in action similar to that of the "arcana"—i. e. it removes, dissolves, cleanses and expels noxious substance. *Sal esurinum* from spa water dissolves mucus and promotes digestion in the stomach.[47] All salts and salty condiments conducive to appetite are of an acid nature, notably salt of the sea, the liquors of sulphur, vitriol, salt, sal nitre.[48]

From all this it is evident that Van Helmont envisages an acid in the stomach which is closely related to mineral acids, such as nitric acid and in particular to the "spirit of salt," i. e. hydrochloric acid (*Salzsaure Geister*).

[41] See above the passage from Fernel, footnote 31.

[42] ". . . hadden sy sterck water, oft andere Zout—suere geesten in die aerde gegoten, sy hadden gesien d'aerde ophesten, en met bobbelen opwaerts rijsen. . . ." *Dageraad ofte Nieuwe Opkomst der Geneeskonst*, Rotterdam, 1660, p. 58. The passage is given in German in *Aufgang der Artzneykunst*, Sultzbach, 1683, p. 157.

[43] ". . . en na gedacht te hebben dat des sterckwaters suerte in ons komt gebooren te worden in den dreck, die te lange in de mage oversuert ist." *Ibid.* p. 58.

"Transl. by Chandler, *loc. cit.* pp. 111-118. "Imago fermenti impraegnat massam semine," *Opera omnia*, ed. Francof., 1707, pp. 107-113. "De Uytwerckinge van Zaden." *Dagheraad*, part VIII, pp. 53-61. Dutch passages additional to the Latin text are intercalated in German translation in the "Aufgang" of 1683, pp. 156-157.

[45] ". . . en zee-zout, het welck oock aengenaem is om de surigheyts wil, die het besluyt," *loc. cit.*, p. 57.

[46] "Potestas medicaminum," 18: "Sensi quoque in stomacho nasci salem acetosum, volatilem partim; partinque fixum," *Opera omnia*, ed. Francof., 1707, p. 541.

[47] "Suppl. de Spadanis fontibus," parad. V, *ibid.* p. 653, see above footnote 39.

[48] "Calor efficienter non digerit," cap. 24. "Sextuplex digestio alimenti humani," cap. 12.

Van Helmont was acquainted with hydrochloric acid as a chemical entity.

In this connection we mention first Van Helmont's "gas of salt." It was prepared by distillation of a watery solution of saltpetre, vitriol and alum in equal parts with the addition of sal ammoniac. Even in the cold, Van Helmont says, a "gas" is released whereby the vessel is broken.[80] Acccording to Hoefer [80] this was hydrochloric acid. Partington,[81] however, regards it as chlorine and nitrosyl chloride—the gas evolved from aqua regia.

Undoubtedly, however, *hydrochloric acid* was the product of another process described by Van Helmont at two places in his work. Here he describes how he prepared the "spirit of salt" by distillation of salt and dried potter's clay.[82]

It is of particular significance for our present purpose that in the invention of this preparation of hydrochloric acid and its recommendation for the stone Van Helmont was inspired by the observation of the stone dissolving properties of the acid ferment in the stomachs of pigeons. In fact, the preparation of hydrochloric acid was devised in order to imitate this action which was found effective only in the living organ—death having extinguished the fermental power of the viscus.[83]

Here again we find the connexion between gastric acid and cure of the stone. The acid, formerly called "hungry acid," *acetosum esurinum*, is here clearly and chemically defined as "spirit of salt," i. e. hydrochloric acid. This suggests that Van Helmont was aware of the true chemical nature, origin and affiliations of his "acid ferment" of the stomach. He

[80] "Complex. et mistion, element. figment.," cap. 37, *Opera omnia*, ed Francof., 1707, p. 105.

[80] Hoefer, *Histoire de la Chimie*, Paris, 1842, tome II, p. 146.

[81] Partington, J. R., Joan Bapt. Van Helmont, *Annals of Science*, 1936, 1: p. 382. See also Kopp, H., *Geschichte der Chemie*, vol. III, Braunschweig, 1845, p. 349, with reference to a gas containing chlorine developed from aqua regia (as described by Van Helmont in "De flatibus"); *ibid.* p. 346-347, on the "spirit of salt" as prepared by Basilius Valentinus and Libavius.

[82] Partington, *loc. cit.*, p. 382 with reference to "De lithiasi," cap. VII (Duelech Resolutum), 28; *Opera omnia*, ed Francof., 1707, vol. II, 52; also to: Butler, ed. Francof., 1707, p. 562, with reference to the method of distillation given in the treatise "On Stone" ("In primis libro De Lithiasi, in ferculo Tyronum, exposui distillandi modum, quo spiritus salis marini, cum terra figulina exsiccata prolicitur."

[83] "De lithiasi," cap. VII, 28, as quoted in preceding footnote: ". . . quod spiritus salis Hispalensis, extremo reverberii igne, una cum terra figuli distillatus, mane singulo bibitus . . . tollat mortales strangurias . . ." Hydrochloric acid taken by mouth is recommended here against the stone; also, *ibidem*, the power of gastric acid to dissolve the stone; it is the "Salis Balsamus, quem nunquam satis expendes."

not only discovered acid gastric digestion, but also hydrochloric acid as its chemical agent.

IV

Finally a word may be added concerning the motives and ideological background of Van Helmont's discovery of acid gastric digestion.

This reflects first of all his deep and lifelong distaste of the "fictitious" "qualities" and "humours" of the ancients and his quest for chemical realities and specific substances. In all this he led the vague ideas of Paracelsus into scientific channels without denying his debt of inspiration to the latter. Like Paracelsus himself Van Helmont is influenced by alchemy.

In spite of his addiction to symbolism the alchemist strives to reach some chemical reality. Traces of ancient humoralism including the high value attributed to heat are still there and Aristotle is quoted with reverence,[54] as befits a medieval writer. Yet emphasis is laid on the auxiliary as against any creative and productive virtue of heat.[55] The creative "philosophical fire" emits beams that are invisible and similarly it is the invisible and spiritual that is searched for. Such a spiritual agent is the "ferment," [56] which has the power of "defeating" a substance by "altering, converting and transmuting" it into something akin to the ferment itself ("ad se"). This is the very power of the Philosopher's Stone. It is "occult" heat which accounts for this process of "digestion" and "concoction." Or else ordinary—external—heat applied by the adept supplies the means whereby the "Stone" receives its power; by the "cooking," superfluous material is removed which impedes action of the stone. It is by the "fermentum massae," engendered "ex massa" and converting into itself "omnem aliam massam," that the Stone "makes itself praegnant" (impraegnat"), conceives from itself and gives birth to itself.[57] Transmutation by the ferment or stone implies the conversion of a metal back from the "terminal" stage in which it is found in nature to

[54] For example: Heat as sustaining the temperate humoral mixture or making it possible for sulphur to "defy" mercury or vice versa whereby "indigestion" is avoided. Petri Boni "Pretiosa margarita novella," cap. XXV in Manget, *Bibliotheca chemica et curiosa*, Genevae, 1702, p. 78.—For Aristotle as overriding authority, cap. XV, *ibid.*, p. 53.

[55] The importance of the *forma* or *anima* as vitalizing and creative force, *ibid.*, cap. XVI, p. 58.

[56] *Ibid.*, cap. XI, pp. 39-41.

[57] This recalls the title of Van Helmont's treatise: "Imago fermenti impraegnat massam semine."

an intermediate stage—an equalisation and assimilation, in other words a "digestion."

The term "ferment" is also connected with "effervescence." Finally, it is something acid, an "acetosus sapor" which indicates that fermentation has taken place in the dough. What remains in a "fixed" form is called "Body," what evaporates under the influence of heat "Soul." This is air according to some philosophers, according to others, fire, cloud or vapour. The name of "Spirit," however, is given to that which is made subtle, dissolved or liquefied by fire and has the power of dissolving a body together with its soul into vapour, or to make a body retain its soul against the force of the fire which tries to drive it out. It thus acts as the link between body and soul.

This briefly is the alchemical idea of the ferments and of fermentation. It contains the elements of Van Helmont's concept: the Ferments "assimilate," i. e. make an object similar to themselves whereby its "digestion" is achieved. The object to be digested is first reduced to a "middle life"—a term of great importance in Van Helmont's work. It loses the terminal form in which it is found in nature, its "perfection" and "fixation," in that it is forced to return to an earlier stage in development from which transmutation is possible. The ferment makes evident "Body, Soul and Spirit" which are normally not perceptible in a natural object.

To this "vitalistic" view belongs the alchemical symbol of "pregnancy" induced in matter (*massa*) by the ferment. We mentioned the formulation of this which recalls almost verbatim the title of one of Van Helmont's treatises.

Van Helmont gave his chemical concept of digestion a vitalistic turn. This was rightly emphasised by Multhauf.[88] Van Helmont says that the acid is not the "vital ferment" itself, but makes its action possible.[89] The invisible "spiritus rector" which is an "image" of the process [90] comes from the spleen, and acts through gastric acid. There is some irony in the fact that Van Helmont should have retained from the Galenic doctrine a function for the spleen in gastric digestion. To him, however, this was an organ of the first importance which he felt it incumbent upon

[88] *Loc. cit.*, p. 162.

[89] "Non est acor fermentum vitale." "Sextupl. digest. alim. hum.," cap. 13.

[90] Fermentum is the "imago rei" i. e. a spiritual experience which displays material effects. "Imago fermenti impraegnat massam semine," cap. 12. This concept therefore appertains to the phenomena which, according to Campanella, are due to a *sensus rerum*. They provide the conceptual basis for *magia naturalis*.

himself to vindicate against the subordinate, merely excretory role assigned to it by Galen.

Van Helmont's vitalistic view of gastric digestion seems to be inspired by the vitalistic idea of fermentation as entertained by the alchemists. The latter made extensive use of the processes of organic life as models for the interpretation of inorganic nature. A similar practice is still found in Paracelsus [61] and to a much lesser degree in Van Helmont. It is in the work of the latter that this procedure is more and more replaced by the converse, namely the application of inorganic chemical patterns to biological processes and it is perhaps on this that Van Helmont's claim as a founder of biochemical method should rest.

To Conclude:

(1) Van Helmont discovered acid to be the agent of gastric digestion. In this he rejected Galenic heat and Fernelian "occult quality"; he adopted the "hungry acid" described by Paracelsus as operative in certain cases only, for example in the stomach of the ostrich or after intake of mineral waters (as preventive of the stone).

(2) *By implication, Van Helmont knew that the "hungry acid" was hydrochloric acid. He prepared it by distillation of seasalt and potter's clay in order to reproduce the strong acid of the bird's stomach which he had observed to be a solvent of the stone.*

(3) In his vitalistic interpretation of digestion Van Helmont was inspired by the concept of "fermentation" as developed in mediaeval alchemy.

Epilogue

We cannot leave the chemical and physiological discovery of Van Helmont without referring to a non-scientific and quite unexpected background: Reuchlin's philosophy. In his work "De verbo mirifico" we find an outspoken rejection of heat as the real agent in digestion.[62] If it were, food could be properly digested anywhere. Digestion, however, belongs to those miraculous works of God in the world which not only employ the virtues of the stars and elements, but also an "Occulta Proprietas." Thus, the action of corals or other amulets is not due to their intrinsic heat or

[61] This is emphasized by Sherlock, F., The Chemical Work of Paracelsus, *Ambix*, 1948, 3:33, but denied by Ganzenmüller, W., Paracelsus und die Alchemie des Mittelalters, *Angewandte Chemie*, 1941, 54:427-431.

[62] "De verbo mirifico," lib. II, cap. 6, in *Artis cabbalisticae*, tomus primus, ed. Pistorius Niddanus, Basileae 1587, p. 912.

cold, but to their being what they are ("tale"). It is a quality that "precedes" their elementary composition, their "nature." It is this which accounts for the differences in quality between natural objects. Gastric digestion as the result of an "occult quality" rather than heat was referred to in the same vein by Agrippa of Nettesheym.[68] Both Reuchlin and Agrippa were intent on a restoration of Pythagorean and Platonic philosophy as expressed in the Poimander of Hermes Trismegistus. It is here that we must look for the real source of Van Helmont's "vitalistic" view which formed a powerful motive in his scientific work. His discovery of acid gastric digestion and indeed of hydrochloric acid as its main agent is thus another instance of the deep entanglement of discovery and mysticism in the XVIIth century.

[68] *De occulta philosophia*, lib. I, cap. 10. See above, footnote 29.

TEXTS AND DOCUMENTS

RUDOLF VIRCHOW: STANDPOINTS IN SCIENTIFIC MEDICINE [1877]*

TRANSLATED BY L. J. RATHER**

Just thirty years ago in April 1847 it was, when, under the same title as that above, I wrote the first paper for the initial issue of these Archives. When now, as we begin the 70th volume, I recall a time lying so far in the past, it is done with the wish that the younger generation now beginning to collaborate in the progress of science may look back with us at the tasks which their elders set up a generation ago and have since unerringly pursued.

At that time we attempted to shake off the spell which philosophy, Nature-philosophy in particular, had woven about science, throughout a long period. We fought against *a priori* speculation; we rejected systems; we relied solely on experience. It was not long before we were reproached for contributing to the decline of science, for putting an endless array of bare and detailed facts in the place of ordered knowledge and for ruthlessly sacrificing millennia of practice on the altar of natural science, without offering the helpless beginner a firm basis for his actions.

We did not permit ourselves to be frightened either by the number or the stature of our opponents. Unconcerned, we confined ourselves to the investigation of isolated problems, completely confident that every new fact would necessarily spread light in fields still dark, and that every forward step would bring about some degree of better insight into the sequence of natural events and thereby a view over a greater field of natural processes. And we were not deceived. The medicine of today so little resembles the medicine of that time, it is so very different from two thousand years of traditional medicine, that it is already considered an indication of special erudition today when someone still commands a full and unprejudiced understanding of the past. How few among phy-

* This is the second essay written by Rudolf Virchow under the title "Ueber die Standpunkte in der wissenschaftlichen Medicin" and published in Virchow's *Archiv*, vol. 70, 1877, pp. 1-10. For the translation of the first essay which appeared 30 years earlier, in 1847, see this *Bulletin*, vol. 30, 1956, pp. 436-449.

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sicians of the present day are able to place themselves in the spirit of an era which did not yet know that capillaries are real vessels with proper walls, that organic muscle fibers are the bearers of movement even in the smallest of organoid formations of the body, that the delicacy of the peripheral nerve network exceeds even the boldest speculations! Yes, how few suspect that the period when all of this was unknown lies only thirty years behind us! What an effort it has cost to overturn a humoral pathology, secured by a thousand bonds of language and popular tradition, and to set up in its place a straightforward science based on direct experience, with a realistic point of view of the tissues and their significance for pathology and therapy! What efforts had to be made in ever-renewed and detailed investigation in order to introduce the genetic principle into pathology also, to establish the developmental history of individual processes and to assign every phenomenon, whether it belongs to the progressive or regressive, active or passive, nutritive, formative or functional categories, to its proper place! And yet we have succeeded in bringing secure order into seeming chaos: the thousands of individual facts have been comprehended in a few well-established laws and made easily accessible to the understanding of the younger generation in this new order.

True, we were enemies of tradition, but time has justified us. We were not, however, such barbarians that we considered it justifiable, as many do today, to despise or even ignore tradition merely because it is tradition. On the contrary, we were convinced that only historical knowledge is genuine knowledge, that justice toward others is the only counterweight to exaggerated self-esteem, and also that valuable lessons can be drawn from the study of error. We have not forgotten this. As different as that which we worked out was from tradition, yet it was our pride to bring it into connection with the verified part of the old science, and to seek out the sources lying behind us from which the newer point of view has taken origin.

He who has only once through his own efforts tried to trace back the long path trod by his predecessors, who has felt how clear and luminous his own knowledge becomes as he grows aware of the historical circumstances through which it has arisen and discovers the basis of the errors through which even genuine investigators have been misled, who has learned that a kernel of truth sticks in every error, will not place himself with those who despise historical studies. Admittedly, however, history which is satisfied by the parading forth of an array of fragmented and disconnected groups of sentences from all periods for the sake of appearing erudite, and without that genuine insight into the significance of what is said available only in the light of its time with a full understanding of

the scientific presuppositions then considered valid, amounts to nothing. We older ones know from our own painful experience well enough how to appreciate this difference, since we are only too well able to estimate the sort of nonsense that can be ascribed to a man of an earlier era when someone plucks out a few scattered statements and tests his newly acquired wisdom on them.

We were enemies of philosophy to be sure, but not of philosophy in general, only of the cocksure, all-knowing, self-satisfied philosophy of the forties. We did not find our method—the currently accepted scientific method—without philosophy. We had respect not only for the "logic of facts" but for logic in general; we exerted ourselves to take up the old well-founded and thoroughly worked out logic, rather than to adjust our standard to the demands of a self-developed logic new for each special case. We were not blind to the advantages of dialectic. We sought for clear-cut conceptions, precision of expression and correct terminology. We exerted ourselves to introduce a scientific language into medicine and to make it impossible for anyone to blur at will our newly won understanding, whether through impressions of the moment, improper generalization, or the tendency to the figurative misuse of conceptions.

Today it sometimes seems as if these were foolish cares, since no one pursues logic and dialectic any longer. Should someone still have an inclination in this direction, he is offered "medical logic" instead of general logic. Again and again terminology becomes confused. Hardly had success been achieved, after a long effort, in clearly outlining the history of fatty metamorphosis and caseous transformation, when fatty degeneration and caseation were exaggerated, intermingled, and brewed into a mixture in which no one is any longer able to distinguish the elements. For many years we strove to bring about the recognition of white blood cells, lymph corpuscles and lymph gland cells by defining the characteristics of each and pointing out the differences. At that time few were inclined to follow us on this path, but nowadays every round cell is a white blood cell and every white blood cell a lymph corpuscle; beyond this hardly anything special remains.

It is the same blind mania of imitation and schematization which has appeared in the "foundations" of men of finance in recent years in a most frightening manner. Where one factory for railway supplies flourished, ten more had immediately to be set up without anyone considering that the same need does not require a tenfold satisfaction. Because one or the other contagious illness is caused by bacteria, immediately all contagion is supposed to be of bacterial nature.

In this connection nothing has had a more devastating effect than the

crude schematization of the Darwinists. It was certainly somewhat surprising to see, for those of us who were still acquainted with the old Nature-philosophy, how the genius of a single man restored to its rightful place an idea already given official status as an *a priori* necessity by the Nature-philosophers, after its long and, alas, not entirely unjustified banishment, not only reactivating it but making it the basis of a general conception of the history of the organic world. But to make an article of faith out of a problem, a principle of synthesis out of a motive for investigation, thereby drugging one's self with assumptions instead of investigating further, was almost worse than the *a priori* approach of the Nature-philosophers. For all the valid facts which had been won in the meantime were stuffed into the new system also, and in this context ran a very definite risk of losing their true meaning in a clothing of hypothesis. The " struggle for existence " seemed to many people something entirely new and unheard of, as if the doctrine of self-preservation and the instinct of self-preservation had not always been the basis of biology. Even the doctrine of heredity, of a phenomenon so commonplace in pathological experience, in its new form dazzled many an otherwise poorly illumined eye. The attempt to consider pathological heredity from an entirely new standpoint led many young workers in our science into displays of erudition in which, singularly enough, the archives of pathology were least often drawn on for contributions.

May I recall in this connection that I belong to those who did not require this new stimulus in order to conceive of the variability of species as a necessary presupposition of the mechanical theory of life? In a lecture concerning the mechanical conception of life, which I gave at the 1858 Congress of Natural Sciences in Karlsruhe, one year before the appearance of the first edition of the *Origin of Species,* I expressed this in the most clear-cut manner (*Vier Reden ueber Leben und Kranksein,* Berlin, 1862, p. 31.) No less had I already in 1849 emphasized as a logical necessity the mechanical origin of all life out of general movement (" Die Einheitsbestrebungen in der wissenschaftlichen Medicin," Berlin, 1849, p. 12; *Gesammelte Abhandlungen,* p. 26-27). I have therefore always been ready and willing to accept in a friendly manner and to treasure as a valuable acquisition every fact which illustrates the variability of the species and the primal creation. But I cannot avoid the expression of a forceful warning, based on my own experience, against taking hypotheses for facts and forgetting the necessity for factual proof of a particular case because of the ease of general explanations.

Nothing was simpler, nothing more logical, nothing more closely in correspondence with the generality of natural scientific views, than the

doctrine of the origin of tissue components from chemical substances, from the so-called blastemas or histogenetic materials. When the Archives started, the descriptions of Schleiden concerning the origin of plant tissue elements, and those of Schwann concerning the origin of animal elements, had just attained general currency. The new, so-called, " cell theory " was the old doctrine of *generatio equivoca* or epigenesis applied to formative processes within the plant and animal organism. The field for this cell theory was nowhere more favorable than in pathology. Every day brought a new confirmation for the correctness of this theory in seemingly quite factual observations concerning the organization of exudates and the primitive blastema. Appearances were so convincing, that one could only wonder why all of this had not been recognized long before. And yet everything has proven false. From all of those investigations, carried out with the greatest devotion and care, absolutely nothing remains insofar as they concern the earliest origins of pathological new formations.

Nothing is more instructive in this connection than a scrutiny of the publications of my too soon departed friend Reinhardt, in particular those concerning the genesis of the microscopic components of inflammatory formations. (*Traube's Beitraege zur experimentellen Pathologie und Therapie,* 1846, fasc. II, p. 145) and the so-called splitting of cell nuclei. (these Archives, 1847, vol. I, p. 528). One must have been, as I was, eyewitness to the tireless observational activity, continued throughout night and day, of this strict and conscientious man in order to experience with me in full the sadness that so much work was carried out in vain, and indeed only because a theory in itself plausible and perhaps in certain instances and with certain modifications applicable, had directed the attention of the observer in a false direction from the beginning on. *Questions asked from a false standpoint unfavorably decide the fate of even the best pieces of work.* A deficiency in logic is not always responsible for the false standpoint, although this is the case often enough. Much oftener the tendency, inherent in mankind, *to overhasty generalization of views correct in themselves* directs the observation away from unprejudiced perception of events and makes *the investigator one-sided.*

What I said about Reinhardt also applies to Schwann himself. The imperishable laurels of these men were not won in the fields where their names resounded with the greatest acclaim from their contemporaries. Not the developmental history of pathological formations but the sequence of retrogressive changes made definitive and permanent progress through Reinhardt. His paper concerning the origin of granular cells, in the first volume of these Archives, should be read carefully at least once by every physician interested in the historical development of our knowledge. And

what makes Schwann immortal is not the "cell theory," not the doctrine of the origin of "hour glass forms" from the "cytoblastema," but the demonstration of *the cellular origin of all tissues*. Later we were able to build on this demonstration, when, as a result of daily observation, the heretical thought of the *continual reproduction of cells within the individual* gradually germinated and grew. These thoughts became the basis of cellular pathology. But I myself needed five more years before I made the first hesitant attempts to proclaim them publicly. Only in the third issue of the fourth volume of the Archives (1852, p. 375), in an essay "Ernaehrungseinheiten und Krankheitsherde," did I begin to break the spell of the "cell theory" and only in the eighth volume (April 1855) did I achieve the presentation of the new standpoint with a certain degree of freedom.

Such reminiscences are well suited to call up in the younger generation a certain degree of caution, even more, of restraint. May they at least contribute to the explanation of my own restraint with respect to the new theories! Many have asked me in surprise why I am not a Darwinist, since my own ideas touch on those of Mr. Darwin. I can only reply that I am a Darwinist at heart just as I am a cosmopolitan at heart. However, just as this inner cosmopolitanism, or, let us say, humanism, does not prevent me from harboring good national sentiments and from feeling in many ways first of all as a German, so am I in science a pathologist first of all, and as such I must strongly emphasize *that pathological formations never develop beyond the physiological possibilities of the species*. In pathology there is no such thing as heterology in the Darwinian sense. That heterology of development (heterophasia), which I defend and as whose foremost proponent I may be permitted to regard myself, applies only to the tissues and not to the species (*Geschwuelste*, I. p. 29). All of the facts which we know allow us to recognize a histological, but not a genealogical change in pathology. And therefore I claim that just as the doctrine of *generatio equivoca* is no longer applicable to histopathology since the disappearance of the "blastema," so the doctrine of the variability of species is impermissible in pathology since the eclipse of the so-called "cell theory." In no way does this imply, however, that beyond histopathology and pathology in general epigenesis or transmutation of the species may not occur.

What we should have learned, in the period of a generation which lies behind us, is above all the realization that *pathology must be an independent science*. The elaboration of the idea that it would not suffice to conceive of pathology as applied physiology and that we needed rather a pathological physiology with its proper field of work and independent activity,

forms a not inconsiderable part of the first leading article with which these Archives were inaugurated thirty years ago. My considerations were directed essentially against the so-called "rational" medicine and the self-designated, "physiological" school, movements at that time in full flower. It was an unpleasant task to reject directions pursued by talented and industrious men. Now that the task is finished, one should remain aware as well that *this emancipation of pathology, this elevation of pathology to the rank of a natural science,* requires before all else that pathologists guard their independence, that they permit no strange science to introduce its hypotheses into pathology at will, in order to prevent it from again being pushed back to the position of a mere applied science. However, we can do this *only if we remain at our tasks and accomplish something.* There will be, as always, no better sign that we are working productively than the delivery of useful fruits to related branches of science, above all to anatomy and physiology. We must be able to give them of our riches and we cannot permit ourselves to sink back again to wanting no more than a share in the wealth of others.

It is no longer necessary today to write that scientific medicine is also the best foundation for medical practice. It is sufficient to point out how completely even the external character of medical practice has changed in the last thirty years. Scientific methods have been introduced everywhere into practice. Diagnosis and prognosis of the physician are based on the experience of the pathological anatomist and the physiologist. Therapeutic doctrine has become a biological and thereby an experimental science. Concepts of healing processes are no longer separated from those of physiological regulatory processes. Even surgical practice has been altered to its foundations not through the empiricism of war, but in a much more radical manner by means of a completely theoretically constructed therapy.

And thus we can celebrate with happy hearts the little anniversary which the Archives now commemorates, as it places itself at the disposal of a second generation. May the array of coming generations seek their honor in equaling the one which now retires! These Archives will in the future reckon it also a particular honor to introduce not only the new directions but the new individuals to the scientific world. All of them require a degree of outside help for their first steps. Many a new direction which first gained strength and recognition in these Archives afterwards created its own journal; many an investigator whose useful works the Archives contained has later started his own publication. Let there be a friendly greeting to all! For the strong also can maintain their strength undiminished only in competition and with constant exercise.

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REPORT OF THE ACTIVITIES OF THE INSTITUTE OF THE HISTORY OF MEDICINE OF THE JOHNS HOPKINS UNIVERSITY

DURING THE ACADEMIC YEAR, 1955-56

I. *Staff*

RICHARD H. SHRYOCK, William H. Welch Professor of the History of Medicine, and Director of the Institute.

OWSEI TEMKIN, Associate Professor of the History of Medicine.

SANFORD V. LARKEY, Lecturer in the History of Medicine.

LUDWIG EDELSTEIN, Lecturer in the History of Medicine.

EDWARD H. HUME, Lecturer in the History of Medicine.

BARKEV S. SANDERS, Lecturer in the History of Medicine.

JANET B. KOUDELKA, Assistant Editor, *Bulletin of the History of Medicine.*

II. *Courses*

Outlines of the History of Medicine. Dr. TEMKIN. First Quarter.

Use of the Library. Dr. LARKEY. First Quarter.

History of Public Health and the Economics of Medical Care. Dr. SHRYOCK and Dr. SANDERS, in collaboration with Dr. WING, School of Hygiene. Second Quarter.

History of American Medicine, Dr. SHRYOCK, Third and Fourth Quarters.

History of General Pathology. Dr. TEMKIN. Third Quarter.

History of Physiology in the Nineteenth Century. Dr. TEMKIN. Fourth Quarter.

III. *Program in Medical History*

The usual courses were offered, in the School of Medicine and in the College at Homewood, in general and special aspects of medical history and in the history of American medicine. Likewise, the course in the history of American public health and medical care was again given,

primarily for advanced students in the School of Hygiene. Meantime, several students in the History Department of the Faculty of Philosophy (Graduate School) selected theses which called for course work and guidance by the Institute staff.

For the first time in some years, Doctors Temkin and Shryock gave no instruction in Philadelphia; but, following their conferences at the College of Physicians in 1954-55, two or more of the medical schools in that city introduced lecture courses as planned.[1]

IV. *Activities of the Staff*

Dr. Temkin and Dr. Shryock read papers at several professional meetings during the year; for example, before the American Association of Medical History, the History of Science Society, and the International Association of University Professors. They lectured at such institutions as the University of Michigan, the University of Pennsylvania, and the University of Maryland. Dr. Larkey addressed the Medical Library Association, and the Conference on the Practical Utilization of Recorded Knowledge (Western Reserve University). Dr. Saunders, representing the President's Commission on Veterans' Pensions, spoke before veterans' organizations concerning disabled veterans.

Dr. Temkin continued to serve as Editor of the *Bulletin* and was elected Vice President of the American Association of the History of Medicine. He spent the summer in research in European libraries, in support of which he received a grant from the American Philosophical Society.

Dr. Larkey continued to serve as a member of the Maryland Board of Public Welfare, and of the Executive Committee of the Chemical-Biological Coordination Center of the National Research Council. He was also made a member of the Advisory Board of the Center for Documentation and Communication Research (Western Reserve University), and was elected a trustee of the Council of the National Library Association.

Dr. Saunders transferred from the staff of the U. S. Social Security Board to that of the National Institutes of Health.

Dr. Shryock served on the councils of several learned societies—including the American Historical Association and the International Union of the History of Science. He was elected a member-at-large of the Social Science Research Council, and a member of the Board of the Russell Sage Foundation.

[1] See Report for 1954-55, *Bulletin of the History of Medicine*, XXIX, Nov.-Dec., 1955, p. 570.

V. *Publications*

Volume XXIX of the *Bulletin of the History of Medicine* was completed in the November-December issue of 1955. This contaned v + 601 pages and 26 illustrations.

The Johns Hopkins University Press published *Soranus' Gynecology, Translated with an Introduction by Owsei Temkin, with the Assistance of Nicholson J. Eastman, Ludwig Edelstein, and Alan F. Gutmacher.*

Professor Alexandre Koyré of the University of Paris, who was a member of the Institute staff in 1952 and 1953, has completed a study in the history of early modern physics, which is based on his Noguchi Lecture at the Institute in 1954. This work will be brought out in the Noguchi series and is now in press.

VI. *Collections and Gifts*

Books	250
Periodicals	
Titles subscribed to	26
Titles exchanged	14
Titles—new subscriptions 1955-1956	2

VII. *The Johns Hopkins Medical History Club*

The Club held two meetings during the year. The officers were Dr. Victor A. McKusick, President; Dr. Richard H. Shryock, Vice President; and Dr. John C. Harvey, Secretary.

The autumn meeting, November 22, 1955, was held on the occasion of a dinner, arranged by the Club, in honor of Professor George W. Corner. Addresses were given by Dr. S. R. M. Reynolds, Staff Member of the Department of Embryology of the Carnegie Institution; Dean Philip Bard of the School of Medicine, Johns Hopkins University; and by Dr. Corner.

The spring meeting was held on May 14, 1956. Dr. Percival Bailey, Professor of Neurology at the University of Illinois, spoke on his personal memories of Dr. Harvey Cushing.

VIII. *Long Range Support for the Institute*

Over an extended period the Rockefeller Foundation has made annual gifts in support of the work of the Institute of the History of Medicine.

In lieu of these annual gifts, the Foundation, in 1955, gave The Johns Hopkins University $200,000 to be used under certain conditions for the Institute of the History of Medicine during a period of not less than ten years. By action of the University Executive Committee, this gift was established as an expendable fund functioning as endowment with income allocated to the Institute of the History of Medicine.

Also during 1955, gifts totalling $100,000 were received from the Avalon Foundation, the Old Dominion Foundation, and the A. W. Mellon Educational and Charitable Trust. These gifts reflected the interest of Mr. Paul Mellon, his sister, Mrs. Mellon Bruce, and the Foundations' other Trustees, in the efforts of the University to foster study of the history of medicine as a basis for full appreciation of the social, cultural and historical aspects of current medical problems in practice. By action of the Executive Committee of the University these gifts have been used to establish the Andrew Mellon Fund for the History of Medicine, as an endowment fund, with income allocated to the Department of the History of Medicine in the School of Medicine.

RICHARD HARRISON SHRYOCK

MEDICO-HISTORICAL NEWS AND ACTIVITIES

ANNOUNCEMENTS

AMERICAN ASSOCIATION OF THE HISTORY OF MEDICINE

First Pan-American Congress of the History of Medicine

The Brazilian Institute of the History of Medicine has announced that the date of the First Pan-American Congress of the History of Medicine has been changed from 14-21 April 1957 to 12-20 October 1957; and that the final date for submitting papers to the Secretary-General of the Congress has been shifted to 31 July 1957. Other details of the arrangement remain as announced in the September-October 1956 issue of this *Bulletin*, pp. 477-478.

NATIONAL NEWS

American Academy of the History of Dentistry

The Academy held its fifth annual meeting at Atlantic City, N. J., September 28, 1956 (see this *Bulletin*, p. 479). The present officers of the Academy are: President, Samuel R. Parks; President-Elect, Williard Camillier; Vice-President, Harold L. Faggart; Secretary-Treasurer, Milton B. Asbell; Editor, George B. Denton.

Chicago

The International College of Surgeons is sponsoring a "First Series of Lectures of the International Surgeons' Hall of Fame and School of the History of Surgery and Related Sciences at the Hall of Fame, 1524 Lake Shore Drive, Chicago." The lectures which will begin at 8 p. m. are scheduled as follows:

October 23: "Beginning of Surgery & Edwin Smith Papyrus," Dr. Leo M. Zimmerman.
November 13: "Surgical Thought and Practice in Ancient Greece and Rome," Dr. Benjamin Spector.
December 4: "Surgery in the Middle Ages," Prof. Loren MacKinney.
January 8: "Early French Surgery," Dr. Guy Kasten Tallmadge.
January 29: "Surgeons and the Rise of Anatomy," Dr. Ilza Veith.
February 19: "Antisepsis and Asepsis," Dr. Eugene M. K. Geiling.
March 12: "British Anatomists and Surgeons," Dr. Lloyd G. Stevenson.
April 2: "The Development of Surgical Anesthesia," Dr. Max Sadove.
May 14: "The Rise of Modern Surgery," Dr. Chauncey Leake.
April 23: "Barber Surgeons and the Liberation of Surgery," Dr. Morris Fishbein.

College of Physicians of Philadelphia, Section of Medical History

The Section's student prize essay contest award is being named the Edward Bell Krumbhaar Award in Medical History. The first prize of this year ($100 and

publication of the winning essay in the College's *Transactions and Studies*) will be presented by Dr. Stanley P. Reimann at the Section's meeting, February 12, 1957.* At the same meeting Dr. Herbert James Dietrich, Jr., will read his translation of the recently discovered original Latin manuscript of John Lawrence's "Oration on the Birthday of Medical Honors in America" (First Medical Commencement Address, University of Pennsylvania, 1768). Dr. Whitfield J. Bell, Jr., will speak on "John Redman: Medical Preceptor of Philadelphia." It is expected that a photo-reproduction of John Lawrence's manuscript with translation as well as Dr. Bell's paper will be published in future issues of the College *Transactions and Studies*.

History of Science Society: The Ida and Henry Schuman Prize in the History of Science

A detailed announcement of the above prize was published in the *Bulletin*, 1955, *29:* 576. Papers submitted for competition should be sent to the Chairman of the Prize Committee, Professor Harry Woolf, Department of History, University of Washington, Seattle 5, Washington. Inquiries about the competition may also be addressed to Professor Woolf. To be eligible for consideration, papers must be received on or before June 1, 1957.

New York: Columbia-Presbyterian Society for Medical History

On February 14, 1956, the Columbia-Presbyterian Society for Medical History held its organizational meeting. Dr. George Rosen addressed the Society on: "Purposes and Values of Medical History." The initiative in organizing the Society was taken by students of the College of Physicians and Surgeons, Faculty of Medicine, Columbia University. Following the initial meeting, three lectures dealing with the history of the College of Physicians and Surgeons, the Presbyterian Hospital, and the Nursing School were sponsored by the Society. Concurrently, an orientation course in the history of medicine, comprising eight lectures, was given by Dr. Rosen. These lectures were intended for first-year students, but were open to any interested students and faculty members.

For the academic year 1956-57, a number of varied activities have been projected. Dinner meetings will be held every third Tuesday of every month. These meetings will be addressed by guest speakers. Among the guest speakers will be Dr. Yale Kneeland, Dr. C. D. Haagensen, Dr. Paul Cranefield, Dr. Gregory Zilboorg, and Dr. Leona Baumgartner. In addition the Society will have papers presented by its members.

Beginning October 25, a series of six lectures on the History of Selected Diseases (malaria, leprosy and plague, syphilis, diphtheria, diabetes, mental disease) will be presented by Dr. George Rosen on consecutive Thursdays (except November 22). Concurrently there will be an exhibit in the College Library of books related to the lectures. These will include rare books from the University's collection.

The Society has also arranged for several discussion groups in specific fields. The subjects and the leaders who have agreed to meet with the group are:

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* The recipient of the award is Dr. Stuart H. Shippey, Jr., who as a student submitted an article on "Professors of Medicine at the University of Pennsylvania."

Medical education	Dr. George Rosen
Pathological anatomy	Dr. Paul Klemperer
Medical Classics	Mrs. Martha Gnudi

Other groups will be organized if there is sufficient demand.

Under the energetic leadership of Miss Kay Richey and Mr. Uri Barzel, the Society has gotten off to a propitious start, and the achievements so far augur well for the future. Two faculty members, Mr. Eric Meyerhoff and Dr. George Rosen, have acted as advisors to the Society.

Northwestern University Medical School

The 1957 lectures in "The Growth of Medicine" will be presented on ten consecutive Tuesdays, at 5-6 p. m., in room 641.

January 8: "The Debt of Medicine to Ancient Greece and Rome," Dr. Barry J. Anson.

January 15: "The Medicine of Primitive and Ancient Man," Dr. Frederick Stenn.

January 22: "The Influence of the Cook County Hospital on Medical Education in the United States," Dr. Raymond W. McNealy.

January 29: "The Development of Our Knowledge of Psychiatry," Dr. Benjamin Boshes."

February 5: "Medical Ethics Through the Ages," Dr. Ilza Veith.

February 12: "Siamese Twins," Dr. Lester Dragstedt.

February 19: "The Growth of Our Knowledge of Tumors," Dr. William B. Wartman.

February 26: "Religio Medici," Dr. Samuel J. Zakon.

March 5: "Medicine Extends Its Eyes," Dr. Leslie B. Arey.

March 12: "The Development of Our Knowledge of Neurology," Dr. Lewis J. Pollock.

Philadelphia General Hospital

A program commemorating the international celebration of the two hundred and fiftieth anniversary of the birth of Benjamin Franklin and the presentation of the Franklin Medal authorized by the 84th Congress of the United States to the Philadelphia General Hospital was sponsored by the Hospital's medical staff for October 18, 1956. Speakers at the event were Thomas M. Durant, Whitfield J. Bell, Jr., Robert J. Hunter, and Cecile R. Kennedy. The medal was presented by Mr. William F. Jackson, Jr., Assistant to the Executive Vice-President of the Franklin Institute, and accepted by Mr. J. Peter Williams, Chairman, Board of Trustees of the Philadelphia General Hospital. Dr. Charles Rupp was the presiding officer.

Wisconsin

The University of Wisconsin announces that Dr. Erwin H. Ackerknecht, chairman of the Department of the History of Medicine at the University of Wisconsin, has accepted the post of director of the medical history institute at the University of Zurich in Switzerland. Dr. Ackerknecht assumes his new position on March 1, 1957.

PROGRAMS OF MEETINGS

AAAS, Section L: History and Philosophy of Science

December 26-28, New York City. The program includes papers related to the history of medicine.

Benjamin Waterhouse Medical History Society

October 29: "Sir Samuel Garth, Poet-Physician," Lawrence McHenry. (Discussion: Merrill Moore).

November 26: "A Precis of Surgical Thought and Practice in Ancient Greece and Rome," Benjamin Spector.

January 21: "Medical Illnesses of Our Presidents," Charles W. Robertson.

February 18: "Edward Augustus Holyoke and Some of His Pupils," Henry R. Viets.

Newly elected officers for 1956-57: President, Charles W. Robertson; Vice-President: Elizabeth K. Moyer; Secretary-Treasurer: John J. Byrne.

History of Science Society

Annual meeting, December 27-29, 1956, at the Hotel Governor Clinton, New York City. Afternoon session of December 29 on "History of Medicine" with: J. B. de C. M. Saunders, "The Transition from Egyptian to Greek Medical Theory"; Genevieve Miller, "Airs, Waters, and Places in History"; Lynn Thorndike, "De complexionibus."

Johns Hopkins Medical History Club

December 17: Pasteur Vallery-Radot, "The History of Allergy and Anaphylaxis Prior to 1921" (with film).

The Osler Medical History Club of Jefferson Medical College

October 29: "Osler, the Medical Student's Guiding Spirit," D. J. LaFia; "Borodin: Physician, Chemist, Composer," William Sunderman, Sr.

November 16: "Influenza—the Plague in Philadelphia in 1918," F. C. Grant.

December 4: "Medical Writing," Jacques Grey.

Society of Medical History of Chicago

November 20: "Apothecaries and Physicians in the Early Eighteenth Century," Lester King; "Medical Education in China," Franklin C. McLean.

December 19: "The Heart in History," Aldo A. Luisada; "Theodore Billroth," George Halperin.

January 16: "The History of Hemophilia in the Royal Family," Carroll L. Birch; "The Seat of the Soul," Percival Bailey.

February 13: "Larrey, Surgeon Raconteur," L. Margueriete Prime; "The Debt of Medicine to Ancient Greece and Rome," Barry J. Anson.

NEWS FROM ABROAD

Harvey Tercentenary Congress 1957

The Tercentenary of the death of William Harvey will be commemorated by an International Congress on the Circulation from June 3 to 7, 1957, in the Royal College of Surgeons, London. The main theme will be "A Review of the Present Knowledge of the Circulation." The Congress is to be opened on Monday, June 3, with a morning session on "Knowledge of the Circulation from the 17th-20th Centuries," with the President, A. Dickson Wright, in the chair, and Professor K. J. Franklin (London), Dr. F. A. Willius (Mayo Clinic), Dr. J. Fulton (Yale University), and Professor Sir Charles Dodds (London) as speakers. The other sessions will be devoted to the following subjects: "The Role of the Heart in the Circulation" (June 3, 2 p. m.); "The Results of Cardiac Surgery" and "The Coronary Circulation" (June 4); "The Pulmonary Circulation" and "The Foetal Circulation" (June 5); "The Cerebral Circulation" and "The Splanchnic Circulation" (June 6); "The Peripheral Circulation" (June 7). The above program will be followed by a week-end conference on the more personal and biographical aspects of Harvey's life at his birthplace—Folkestone, Kent—on Saturday, June 8, 1957, with Sir Geoffrey Keynes as chairman. The following events are foreseen for that day:

10:30 a. m.	"Harvey's Birthplace," Professor T. Hare (London)
	"Harvey at Cambridge," Professor Sir Lionel Whitby (Cambridge)
	"Harvey at Padua," Professor A. P. Cawadias (London)
	"Harvey and French Medicine," Professor L. Chauvois (Paris)
	"Harvard the Scientist," Dr. W. R. Bett
Afternoon	Visit to Canterbury Cathedral.
Evening	Civic Reception.

Registration Fees: £10 0s. 0d. sterling for full membership to both the scientific program and social functions. Alternative enrollment fee of £1 0s. 0d. sterling daily for scientific sessions only. Further details and application for membership from: Congress Secretary, 11 Chandos Street, Cavendish Square, London, W. 1.

New Journal

"*Medical History.* A Quarterly Journal Devoted to the History and Bibliography of Medicine and the Related Sciences" is the title of a new quarterly publication that will appear as the "Official Organ of the Cambridge University History of Medicine Society and the Scottish Society of the History of Medicine." It will be edited by W. J. Bishop and published by Wm. Dawson Sons, Ltd., 4 Duke Street, Manchester Square, London, W. 1. Annual subscription for non-members is £2 10s. ($7.50), single copies, 15s. ($2.25). Publication will commence on January 1, 1957, and each issue will contain approximately 100 pages of text together with illustrations.

BOOK REVIEWS

THOMAS PHAIRE. *The Boke of Chyldren.* Ed. A. V. Neale and Hugh R. E. Wallis. Edinburgh and London: E. & S. Livingstone (Baltimore: The Williams & Wilkins Co.), 1955. 76 pp. Ill. $2.75.

This publication is an exact copy in modern type of the 1553, fourth edition of the *Boke of Chyldren*, the first book on diseases of children written in English. To the reprint have been added an introduction, a very useful glossary, and references. The illustrations consist of a photographic reproduction of the first two pages and a facsimile of two pages, all from the undated eighth edition of the *Book of Children* listed by Pollard and Redgrave in *A Short Title Catalogue of Books Printed in England . . . 1475-1640* as number 11975, date of publication 1578?.

The *Boke of Chyldren* written by Phaire was first added to *A new booke entytled the Regiment of lyfe by John Bourot, lately translated out of Frenche by T. Phayer; with a singular treatise of the pestilence by T. Phayer* in 1545. Altogether the combined work—the Regiment of Life being the Regimen Sanitatis Salerni—went through nine editions, 1545, 1546, 1550, 1553, 1560, 1565?, 1567, 1578? and 1596, the *Short Title Catalogue numbers* 11968-11976 inclusive. In the *S. T. C.* fifteen copies of the book are listed. Wm. W. Bishop in *A Checklist of American Copies of Short Title Catalogue Books* (2nd edition, Ann Arbor, 1950), locates twelve copies in America, in the Huntington Library, San Marino, California; Folger Shakespeare Library, Washington; Armed Forces Medical Library; Boston Medical Library; New York Academy of Medicine; University of Michigan; and the University of Wisconsin. He notes that a microfilm has been made of the first edition. To Bishop's census can be added five copies, including the 1578? edition not located by him, in the reviewer's library.

In addition to being the first paediatric book written in English the volume is one of the earliest medical texts printed in that language and even twenty-five years ago, as stated by Ruhräh, was a rare book sought by collectors. No copy has been noted in the last 7 or 8 years in many catalogues of old medical books from the mere perusal of which your reviewer derives much pleasure. In the present inflated state of the antique medical book market if a copy appeared the price would probably be from two to three hundred dollars.

In *Pediatrics of the Past* by John Ruhräh (Paul B. Hoeber, New York, 1925), the text of the first, 1545, edition of the *Boke of Chyldren* is reproduced in full. Portions are also reprinted by George Frederick Still, in *The History of Paediatrics* (Oxford University Press, London, 1931). As stated in Phaer's preface "But my purpose is here to doo theym good that have moste nede, that is to saye, children: and to shewe the remedies that god hath created for the use of man, to distribute in englyshe to them that are unlearned, parte of the treasure that is in other language, to provoke thē that are of better learnyng to utter their knowledge in such lyke attemptes: finally to declare that to the use of many whyche oughte not to be secrete for lucre of a fewe:"

The authors of the present edition have performed a real service in making available to a wider group this work by the father of English paediatrics. The glossary will render it very valuable even to those who are fortunate enough to possess or have unlimited access to one of the original editions. Be assured that a perusal of this volume will bring much pleasure not only to those interested in old medical books but to all concerned with the medical care and welfare of the infant and child. Perchance it may even be the introduction of some to that most interesting of hobbies, the collecting of antique medical books, a hobby that can be pursued with much enjoyment throughout the whole of one's life.

T. G. H. Drake

Henry E. Sigerist. *Landmarks in the History of Hygiene.* London and New York: Oxford University Press, 1956. viii + 78 pp. Ill. $3.00.

In 1952 Henry E. Sigerist delivered the Heath Clark Lectures at the London School of Hygiene and Tropical Medicine, choosing as the subject certain high points in the history of hygiene. These lectures have now been published, and give us still another interesting and stimulating contribution by this leading medical historian. The term hygiene as employed by Sigerist is comprehensive, and includes both individual hygiene as well as public health in the conventional sense. From this broad viewpoint, certain men, books, and trends have been chosen for discussion because of their influence on our views of health and disease. In time, the topics range from classical antiquity to the present. Nevertheless, this is not a disjointed series of essays; the separate chapters are bound together by a philosophy, by the idea that every situation in which we find ourselves is the product of definite historical trends and developments, and that an understanding of the situation requires some knowledge of this development.

The five chapters of this volume deal successively with Galen's *Hygiene*, the *Regimen sanitatis* of Salerno, the Renaissance quest for longevity, Johann Peter Frank as a pioneer of social medicine, and the changing pattern of medical care. Each subject is treated not only to reveal its own intrinsic interest, but so as to indicate its broader implications as well. Frequently there are brief digressions that are of interest in their own right. Thus in the discussion of Galen's *Hygiene*, there is included a brief but comprehensive analysis of the bases of hygiene and public health, with a glance at the nutrition of the Bantu and the American Indians and its adequacy without a knowledge of biochemistry. Similar points of interest will be found in other chapters. As always, Dr. Sigerist's style is lucid and straightforward, thus adding in considerable measure to one's pleasure while reading the book.

Americans who are acquainted with the author's activities on behalf of a national health insurance scheme in the 'thirties will find much of interest in the last chapter. Of special interest is Dr. Sigerist's present position from which he points out the inadequacies of compulsory health insurance as it has been set up and administered in European countries up to the present, and advocates the establishment of group

practice around a health center. Financing of such a system, it is pointed out, may be accomplished in one of several ways, or by a combination of methods.

This slim but delightful volume provides a pleasant introduction to an important subject, and is recommended to anyone interested in individual and community health problems and their handling at various historical periods.

GEORGE ROSEN

WILSON G. SMILLIE. *Public Health. Its Promise for the Future.* A Chronicle of the Development of Public Health in the United States, 1607-1914. New York: The Macmillan Company, 1955. x + 501 pp. Ill. $7.00.

Public health has been poorly served by historians. For the most part professional historians have paid little or no attention to the impact of health problems on historical events, or to the relevance of such problems to the development of civilization. A few events that cannot be overlooked, such as the Black Death of 1348-49, are noticed; but the ways in which communities in time and space have acted in relation to health and disease have generally been ignored. Within recent decades students of social history have begun to investigate this subject. A difficulty faced by such investigators is that they are not versed in the technical aspects of public health.

On the other hand, public health workers who have undertaken to give historical accounts of their field have not succeeded because they have not had any historical training. Nevertheless, the public health worker who is aware of his limitations and restricts his endeavors to a straightforward narrative account may provide a usable factual basis for later workers who may be more fully trained in historical method. Dr. Smillie, a leader of American public health, has wisely followed the latter course, with the result that he has produced a very interesting and useful volume.

This book is a chronicle of the development of public health in the United States from 1607 to 1914. It comprises 46 chapters divided into three sections: The Colonial Period—1600-1790; The Pioneer Period—1790-1861; The Period of Development—The Civil War to World War I. An Appendix deals with the "Great Pioneers of Public Health in America, 1610-1925."

Public Health rests on the general principle that every member of the community is entitled to protection of his health, and that the community must take action to see that this is done. In tracing the path that has been followed in the United States toward the achievement of this goal, Dr. Smillie has collected a large amount of information. He has not restricted himself to the story of epidemics, or administration, but instead has taken the whole gamut of public health activity under scrutiny. Thus, he deals with communicable diseases (cholera, malaria, typhoid and typhus fevers), environmental hygiene, nutrition, medical care, health education, vital statistics, professional organization, occupational health, the rise of the public health nurse, the development of public health administration—in short, the manifold forms of community action in the interest of health. Dr. Smillie has read widely and labored diligently to collect the facts that have gone into his story.

While one may regret that the author decided to end his story in 1914 just when the most recent period, the one in which he himself has played a significant part, was opening up, there can be no doubt that he has indicated how public health got to that point. This is a book that can be useful to the public health worker, to the student of medicine or public health, indeed to anyone who wants information how community action in the interest of health grew in the United States.

GEORGE ROSEN

AGATHA YOUNG. *Scalpel: Men Who Made Surgery*. New York: Random House, 1956. viii + 311 pp. Ill. $5.00.

Public interest in medical progress is more intense than at any earlier period. New medical discoveries, brought forth at machine-gun tempo, have captured the popular imagination. Newspaper reports and magazine articles on medical subjects are devoured and relished with ever increasing avidity. Because of its innate dramatic qualities, surgery has had a particular appeal. A layman's history of surgery is certain to find an expectant and appreciative public.

Such a book is *Scalpel*, by Agatha Young. Sub-titled " Men Who Made Surgery," it purports to tell the story by recounting the lives and work of Vesalius, Paré, Lister, Harvey, Hunter, McDowell, Halsted, Cushing, and the discoverers of anesthesia. The book gives evidence of a prodigious amount of travel and research on the part of the author, in pursuit of her material. She has unearthed a wealth of biographical and anecdotal detail which, related in a free-flowing, easily readable style, has culminated in a very interesting book. Titans in the evolution of surgery, hitherto little-known to the general public, have been made real and living. Popular success should greet this venture.

Of course, this is not the history of surgery. At the outset are listed the four major difficulties that had to be overcome before modern surgery was possible. These—hemorrhage, pain, infection and shock—become the headings of the four sections into which the book is divided. They are chronologically arranged in the above order, as a successive series of hurdles to be cleared or of barricades to be stormed; and the consecutive biographies are made to fall into these divisions. The artificiality of this arrangement is obvious. Are Vesalius, Paré, Harvey, Hunter, and McDowell to be esteemed entirely, or even particularly, for their contributions in the control of the hazard of hemorrhage? Or are the later figures to be similarly confined? Certainly, no such step-like development characterizes the growth of surgery.

There is, too, the arbitrary selection of the heroes to be included in this surgical pantheon. By inference, and even by title, these are the men who made surgery. To ascribe the creation of the art and science of surgery to *any* half-dozen individuals is to distort the picture and to do injustice to the myriad of patient workers, both within and outside the craft, who have collectively erected the proud edifice of modern surgical practice. With due acknowledgment of the merits of the book, the history of surgery, whether for the layman, doctor, or historian, remains yet to be written.

LEO M. ZIMMERMAN

FRANCIS M. RACKEMANN. *The Inquisitive Physician. The Life and Times of George Richards Minot, A.B., M.D., D.Sc.* Cambridge, Mass.: Harvard Univ. Press, 1956. xi + 288 pp. Ill. $5.00.

George R. Minot (1885-1950) was the Boston physician, scientist and teacher who discovered the effectiveness of liver in the treatment of pernicious anemia. The eminence of the man and the magnitude of his contribution justify the publication of his biography. The author, Dr. Francis M. Rackemann, was Minot's cousin, classmate, friend, companion, and colleague; he thus knew his subject at every stage of life and in nearly all aspects.

Minot was a student at the Harvard Medical School in 1910, the year of the famous Flexner Report on medical education. His life as physician and research scientist thus fell within the era of rapid development and reform which might be designated the post-Flexner period. Dr. Rackemann tells us that in 1912 when he and Minot were "house pupils" at the Massachusetts General Hospital, there were no residents. Almost no clinical research was in progress. "Neither the Hospital nor the Harvard Medical School had had experience with a full-time paid professor in the clinical departments, nor had they had the funds" to support one. The total research expenditure at the School in 1912 was $21,000, compared with about $2,000,000 in 1953-4; the total expenditure of the School in 1912 was $300,000, contrasted with $1,200,000 in 1935. In the Harvard sphere of influence the development really had started with Charles Eliot's action in raising the entrance requirements of the Medical School (effective date 1905). In 1912 Dr. David L. Edsall became Jackson Professor of Clinical Medicine at Harvard and Chief of Medical Services at the Massachusetts General Hospital. This appointment guaranteed the unified development of medical school and hospital according to a pattern that had been established previously at Johns Hopkins and was later to become almost universal in the United States. Other important events on the Boston scene were the opening of the Collis P. Huntington Memorial Hospital, the opening of the Peter Bent Brigham Hospital, and the opening of the Thorndike Memorial Laboratory (1923). Minot had responsibilities at each of these institutions. Notably, he was director of the Thorndike from 1928 to 1949.

From the viewpoint of the casual reader, especially the layman, the climax of Dr. Rackemann's book is probably the eleventh chapter. This tells of Minot's receipt of the news that he had been awarded the Nobel Prize. Then follows a detailed description of this feelings and reactions, and of those of his friends. Finally the author gives us a minute account of the ceremonies in Sweden. All those who expect to win the Nobel Prize should memorize this part of the text.

Equally full of human interest is the story of Minot's affliction. In 1921 at the age of 36 he developed severe diabetes, partly controllable by the severe starvation regimen which was often necssary in the pre-insulin era. Dr. Rackemann describes the onerous daily routine which the disease imposed upon Dr. Minot and his faithful wife. In January 1922, Banting and Best began to treat diabetic patients with their new pancreatic extract, later named "insulin." Not until a year later was Dr. Joslin able to procure a small amount of the purified substance for Minot. It is probable that but for the timely advent of insulin Minot would not have lived to carry out his own famous researches.

For the historian the most important part of the biography is the chapter which describes the evolution of Minot's ideas on pernicious anemia. The pathways of his thinking are not charted with full clarity and perhaps could not have been reconstructed in exact detail, even from the abundant sources available. A few components and a few stages can be discerned. Even before he entered medical school Minot was interested in the whole man, background as well as foreground. At Harvard College he had studied anthropology and social ethics; in 1907 he had written a student thesis on medical social service. At an early date his interest in the patient's total background included an interest in diet. He noticed defects in the dietary of many people, including some anemic persons. As early as 1912, while house officer at the Massachusetts General Hospital, he had the idea that something in food might be of advantage to patients who had pernicious anemia. From Dr. J. Homer Wright he learned of the use of brilliant cresyl blue for intravital staining; this led to Minot's important discovery of the significance of reticulocytosis. He began to suspect (a) that diet might have something to do with the cause of pernicious anemia (b) that the varied types of erythrocyte encountered in that disease represent different stages of maturation, and (c) that the bone marrow needs some kind of special nutriment. These surmises are in part older ideas subtly transformed by a superior mind; this mysterious act of transforming insight seems to be about as near as we can come to the arcane center of the process. In the later progress of his thinking Minot eagerly adopted Greorge H. Whipple's discovery of the effectiveness of liver in the treatment of experimental blood-loss anemia and applied it to pernicious anemia. As Dr. W. B. Castle has said, ". . . many physicians fed diets containing liver to patients with pernicious anemia without convincing others of their value. Only Minot had the instincts and the persistence essential for clear-cut success. . . . Looking back, one finds it difficult to understand why this great clinical discovery, made in the end by such simple means, was delayed until well into the twentieth century. Probably, this was because, at last, in their own consistently successful dietary regimen, Minot and Murphy knowingly took no chances of inadequacy of dosage or of omitting possible essentials."

Dr. Rackemann's book is written in a simple, dignified and straightforward way. It is descriptive, not adulatory, and not overdramatic. It contains many engaging vignettes—of life at Harvard, of New England pastimes, of life in a teaching hospital during peace and in wartime. It depicts Minot's strong points, such as his patience, perseverance, inquisitiveness, and courage, while not omitting his defects, which included shyness, a degree of physical maladroitness, and difficulty in literary expression. Most instructively it depicts certain contrasts in Minot's attitudes, such as that between his aristocratic Boston heredity and his advocacy of social medicine, likewise the contrast between his wide interest in man and his selective detachment from American life. The book thus commends itself equally to the student of human nature, the student of medicine, and the medical historian.

SAUL JARCHO

MARVIN K. OPLER. *Culture, Psychiatry, and Human Values.* The Methods and Values of a Social Psychiatry. With a Foreword by Thomas A. C. Rennie. Springfield, Ill.: Charles C. Thomas, 1956. xiii + 242 pp. $6.00.

When about twenty-five years ago the anthropologists Sapir, Ruth Benedict, and Hallowell showed that psychological normalcy and pathology vary with the cultural setting, they made a definite contribution to psychiatry, and opened an era of collaboration between psychiatrists and anthropologists (listed in p. 59 of this book). Dr. Opler devotes almost one-third of his book (pp. 65-139) to a review of the newer evidence for culture-caused variation in psychopathology. He belongs to those who feel able to summarize a great number of symptomatically and prognostically most dissimilar forms of "exotic" mental disease under the label of "schizophrenia." He also develops Malinowski's criticism of the generalizing of subculturebound mechanisms by Sigmund Freud. He reformulates the anthropological argument for the close relations of culture and psychology via value systems. His main goal seems to consist in giving a methodological blueprint for "an emerging inter-disciplinary science, social psychiatry."

He feels that cultural references would bring together present nonetiological incidence statistics, and clinical observation, producing only nonsignificant series, into an etiological epidemiology, and that such references would eliminate a number of misunderstandings and sterile notions now existing in incidence statistics.

The author cannot be blamed for ignoring largely the biological level. Most of us do. But it might be appropriate to emphasize that this is not due to its inexistence but to our longstanding inability to acquire relevant knowledge of it; a situation, which might change. As the dust cover emphatically announces historical data in the book, I feel obliged to specify that, with two or three exceptions, the author does not go back beyond the turn of the century either in the history of mental disease or in the history of psychiatry. The book summarizes a great deal of material and contains a goodly number of fine ideas. But I must confess that one successful concrete study done along the lines recommended by the author would probably be more convincing than many methodological considerations; all the more so as Dr. Opler makes no concessions to lay English, but expresses himself consistently in that peculiar dialect which has arisen in the psychiatric-anthropological subculture during the last two decades. It is regrettable that precise references are given only for a minority of the very numerous authors referred to in the text.

ERWIN H. ACKERKNECHT

IRA A. KIPNIS. *A Venture Forward.* A History of the American College of Hospital Administrators. Chicago, Ill.: American College of Hospital Administrators, 1955. 145 pp. Ill. $5.00.

The American College of Hospital Administrators was established in 1933 as a professional association of hospital directors. Its aim since its inception has been to increase the competence of the nation's hospital administrators through the establishment of standards and educational programs. This book tells of the organization's founding and its growing pains, and gives some indication of its present role in hospital affairs. It will be of interest only to those readers of this journal who are themselves active in the administration of hospitals.

COLIN W. CHURCHILL

THE BULLETIN RECENTLY RECEIVED*

Giovanni P. Arcieri. *Agostino Bassi in the History of Medical Thought.* A. Bassi and L. Pasteur. Supplement, *Rivista di Storia delle Scienze Mediche e Naturali,* vol. 47, 1956. Firenze: Leo S. Olschki, 1956. 40 pp. Ill.

George Griffenhagen. *Pharmacy Museums.* Madison, Wisconsin: American Institute of the History of Pharmacy, 1956. 51 pp. Ill.

Medical Department, United States Army. *Surgery in World War II*: Volume II, General Surgery. Edited by John Boyd Coates, Jr., and Michael E. DeBakey. Washington, D. C.: Office of the Surgeon General, Department of the Army, 1955. xxiv + 417 pp. Ill.

Medical Department, United States Army. *Surgery in World War II*: Orthopedic Surgery in the European Theater of Operations. Edited by John Boyd Coates, Jr., and Mather Cleveland. Washington, D. C.: Office of the Surgeon General, Department of the Army, 1956. xv + 397 pp. Ill.

Arthur William Meyer. *Human Generation.* Conclusions of Burdach, Döllinger, and von Baer. Stanford, California: Stanford University Press, 1956. ix + 143 pp. $3.50.

Official History of the Canadian Medical Services, 1939-1945. Volume I: Organization and Campaigns. Edited by W. R. Feasby. Ottawa: Edmond Cloutier, 1956. xii + 568 pp. Ill. $5.00.

Maria Rooseboom. *Microscopium.* Leiden: Rijksmuseum voor de Geschiedenis der Natuurwetenschappen, 1956. 60 pp. Ill.

Gustav Scherz. *Vom Wege Niels Stensens.* Beiträge zu seiner naturwissenschaftlichen Entwicklung. Kopenhagen: Munksgaard, 1956. [Acta Historica Scientiarum Naturalium et Medicinalium, vol. 14.] 248 pp. Ill. Dan. Kr. 25.

The Scottish Society of the History of Medicine. *Report of Proceedings, Session 1955-56.* Edinburgh, 1956. 34 pp. Ill.

* The *Bulletin* reserves freedom of decision as to the publications to be listed in this section.

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BY

OTHO T. BEALL, JR. AND RICHARD H. SHRYOCK

The first aim of this study is to present the Reverend Cotton Mather in a new dimension—as "the first significant figure in American medicine." The authors show that the historic tendency to present Mather as merely a reactionary theologian gives far from the whole picture of the man. One of the most interesting features of the book is its reappraisal of Cotton Mather as one who, within the intellectual framework of his times and his profession, was a leading light of early American science.

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In the appendix will be found selected sections from Mather's chief medical work, "The Angel of Bethesda," here printed for the first time.

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I. BERNARD COHEN

Two hundred years ago, Benjamin Franklin published this account of the first permanent hospital in America. Anyone interested in the history of medicine will find a wealth of information contained in these pages written and printed by America's foremost citizen. In addition to the financial details of the Hospital's founding, Franklin includes an abstract of the first cases admitted, and their disposition.

The Introduction by I. Bernard Cohen puts the work into proper historical perspective and provides considerable new and detailed insights into the various influences which shaped Franklin's interest in public health.

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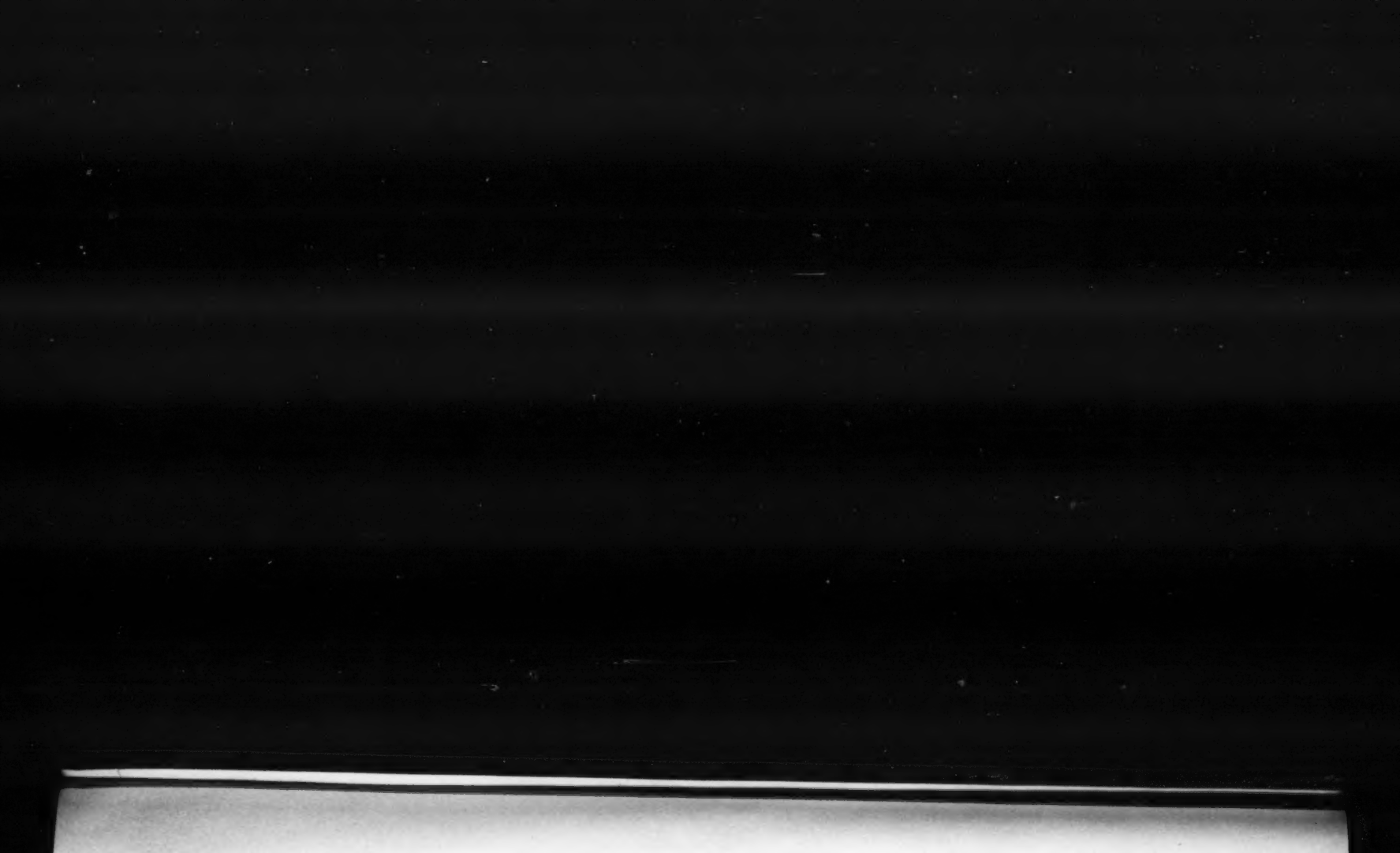
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